NOVEMBER, 1951

American Engineer

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IN THIS ISSUE . . .

The Case for the National Science Foundation

By Dr. Alan T. Waterman,
Director, National Science Foundation

. . . and these two articles about the profession

How Important Is Personality To The Professional Engineer?

Twentieth-Century Pony Express
By Frank W. Shelton, Jr., P.E.,
A.T. & T. Executive

. . . and six additional features for and about professional engineers

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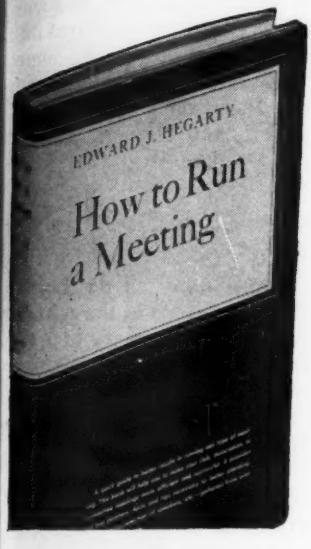

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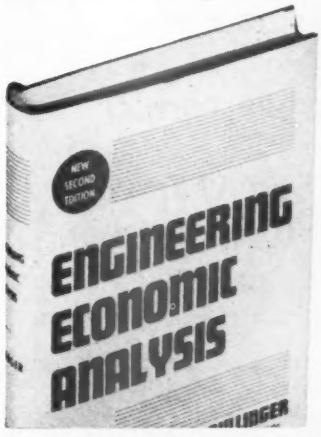

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Letters

Westchester Resolution . . .

Dear Editor:

In recognition of the excellent content of the AMERICAN ENGINEER, our member Henry T. Hotchkiss, ChE, ScM, P.E., introduced a resolution at the September meeting of the Westchester Chapter which was unanimously carried as set forth on the accompanying page. (*See below—Ed.*)

We, of the Westchester Chapter, are proud of the AMERICAN ENGINEER, and extend our best wishes to you and to the staff for continued success on this publication.

Sincerely yours,
NORMAN S. ODELL, P.E.,
President, Westchester County Chapter,
New York SSPE.

Resolution

Whereas the official publication of the National Society of Professional Engineers is vital to the growth and prestige of all engineers and

Whereas the September 1951 issue is an outstanding example of fine editorial effort

Be it resolved that the Westchester County Chapter of the New York State Society go on record as extending congratulations to Editor Kenneth E. Trombley and be it further resolved that a copy of this resolution be forwarded to him with the request that he extend best wishes to all members of his staff in this connection.

► As I pointed out in my recent letter to Mr. Odell, it was most kind and thoughtful of the Westchester Chapter to accept unanimously the resolution introduced by Engineer Henry T. Hotchkiss, which extends congratulations and best wishes to the staff of the American Engineer.

I say in all sincerity, and I now speak for my excellent staff members, Miss Barbara Haislip, Assistant to the Editor, and Mr. David A. Heller, Staff Writer, that this kind of recognition of our efforts has the happy result of making us strive more than ever to make the publication a magazine of which the profession can be aptly proud.—*Editor.*

Films On Engineers . . .

Dear Editor:

In line with your closing October editorial it is suggested that there is an existing group that has the interest, the facilities, and the motives for producing orientational movies on engineering. The body referred to is that which produces documentary and educational films for the government —both of the U.S. and Canada.

GEORGE S. MURPHY,
Detroit, Mich.

► Thanks. We are contacting them. —*Editor.*

Articles By Businessmen . . .

Dear Editor:

Have just read with interest the October issue of the AMERICAN ENGINEER. Believe this issue is a great improvement. Would like to see more articles by engineers in business . . . rather than those on education, etc.

WILLARD HIRSCH, P.E.,
Cleveland Hts., O.

September Issue . . .

Dear Editor:

Please congratulate all on the excellent September issue of the AMERICAN ENGINEER. I hope every Chapter uses it (as we have) to solicit new members. It is certainly something we need not hesitate to send to the most discriminating prospective member.

GEO. W. ZIMMER, JR., P.E.,
Wheeling, W. Va.

Dear Editor:

Your September issue of the magazine is a great credit to the staff and to NSPE. Congratulations.

LLOYD A. CHACEY,
Executive Secretary, Ohio SPE,
Columbus, O.

Dear Editor:

I think you did quite a fine job on that September Defense Issue of the AMERICAN ENGINEER. Congratulations. Everything came out fine including Major Seversky's article.

Did any appreciable number of copies of that Defense Issue go to U. S. Congressmen? (*See below—Ed.*)

FRANK M. BILLHIMER, P.E.,
New York, N. Y.

Dear Editor:

May I congratulate you on the September issue of AMERICAN ENGINEER. It is certainly a most excellent job. I have been noticing that every month this AMERICAN ENGINEER begins to look more and more like a publication put out by someone that knows how to do it.

Incidentally, the article "Air Power," by Major Alexander P. de Seversky, is a very provocative one

(*Continued on page 6*)

To convince those who count . . . reach these *important professionals!*

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WARREN T. MAYERS, *Advertising Manager*
THE AMERICAN ENGINEER
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American Engineer

Letters

(*Continued from page 4*)

and I am wondering if you have arranged to get copies of it in the hands of all our Senators and Representatives. I think they should all see that article and particularly those who happen to be on various Armed Services Committees.

C. B. BROSCHART, P. E.,
Philadelphia, Pa.

► Engineer Broschart's suggestion was voiced by many readers. The September Issue has been sent to all Senators and to important House members.—*Editor.*

Dear Editor:

I consider the article by Maj. Seversky the finest ever written on our defense effort, and earnestly desire to procure a copy of your September, 1951, issue.

KENNETH B. EDMUNDS, P.E.,
Ashland, Mass.

Dear Editor:

Too much time has passed (for which I apologize) since noting the splendid job you folks did on the AMERICAN ENGINEER for September 1951. Sincerest congratulations to you and the staff on this fine example of editorial effort and publication technique. Best regards.

CLARENCE T. SHOCH, P.E.,
Chairman, Legislative Committee, NSPE,
Allentown, Pa.

Dear Editor:

The September issue was really a very good one. I read every article and did not find one that was not of interest to me. I passed my copy along to many non-members of NSPE and they, too, were impressed.

JOHN S. KEE,
Chicago, Ill.

Dear Editor:

Major de Seversky has done a wonderful job in his article in the September issue. . . It is the best interpretation I have read on our defense setup. I hope you will be able to publish more special issues although each issue is received with interest.

J. U. ZIMBALL,
Cleveland, O.

Dear Editor:

. . . the Glennan interview in the September issue had much worthwhile information for the professional engineer wanting information about the atomic energy program. Please publish more articles that are helpful to the employed engineer.

TEMPLE H. SMITH,
Atlanta, Ga.

Diagram Trouble . . .

Dear Editor:

The opening of school delayed somewhat my reading of the September issue of the AMERICAN ENGINEER. I have, however, found considerable interest in reading Major de Seversky's article on "Strength and Security with Air Power." The point of view of the author is an interesting one and I am sure provides much food for thought. It would be surprising, however, if his point of view were not biased by his experience.

My letter to you, however, is to object strenuously to the inclusion in the AMERICAN ENGINEER of the type of diagram located on page 16. As engineers we pride ourselves on telling the truth and this is not done by this diagram. It is true that the diagram has been labeled so that presumably the person who prepared it could deny specific fraud. It is noted that there are two divisions along the abscissa of equal length, one representing three months and the other representing six months. Furthermore, it is noted that the first 10,000 casualties listed as ordinates has only one-half the size of the last 10,000, all of which tends to give the same slope for rate of casualties during the period January to June 1951 as from October 1950 to January 1951. A numerical division, however, shows that there were approximately 10,000 casualties per month during the fall and about 3500 during the other six months.

It seems to me that the editorial policy of our society should include a sufficiently careful review of articles which are published to prevent such obvious misuse of the engineer's chief tool of graphic presentation.

FRED H. PUMPHREY,
Professor of Electrical Engineering,
Gainesville, Fla.

► We confess that the diagram referred to would not stand up under detailed engineering examination. It does, though, get the point across that to June, 1951, we had 70,000 casualties in Korea.—*Editor.*

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American Engineer

NOVEMBER
1951

" . . . man-made machines and the harnessing of natural resources are progressively relieving humanity from the distress of an oppressively heavy physical toil and are affording improved opportunity for the development of mind and spirit. This is the challenging opportunity — and responsibility — of the engineer and his profession."

W. E. Wickenden, P.E., Past President, Case Institute of Technology.

How Important Is Personality To The Professional Engineer 9

Is the need for a good personality given too much emphasis? What about technical knowledge versus "human engineering"? Read what seven outstanding engineers believe.

The Case for the National Science Foundation 12

By Dr. Alan T. Waterman, NSF Director. NSPE has long stood behind this "ignored" agency. Here's why the Nation and the engineering profession needs it.

Twentieth-Century Pony Express 16

By Frank W. Shelton, Jr., American Telephone and Telegraph Company Executive. The coast-to-coast radio relay system is the newest advance in communications—thanks to the engineering profession. This is how it works by a man who should know.

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Kenneth E. Trombley,
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●

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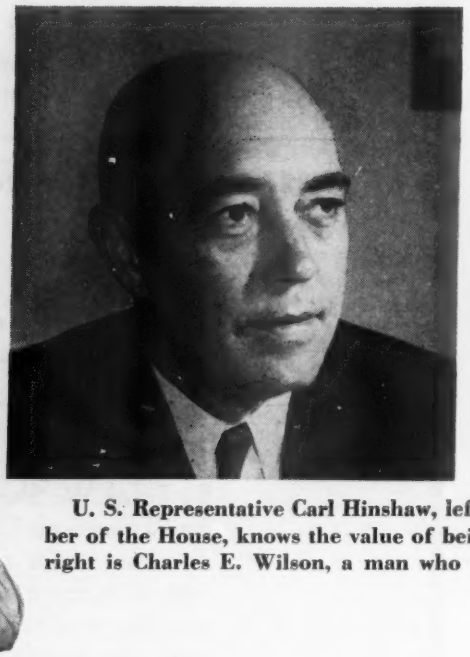
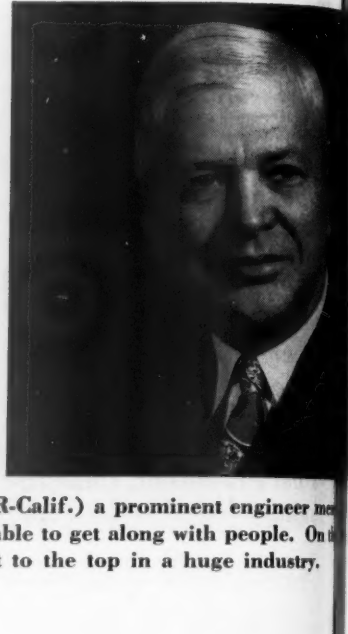
How Important Is Personality The

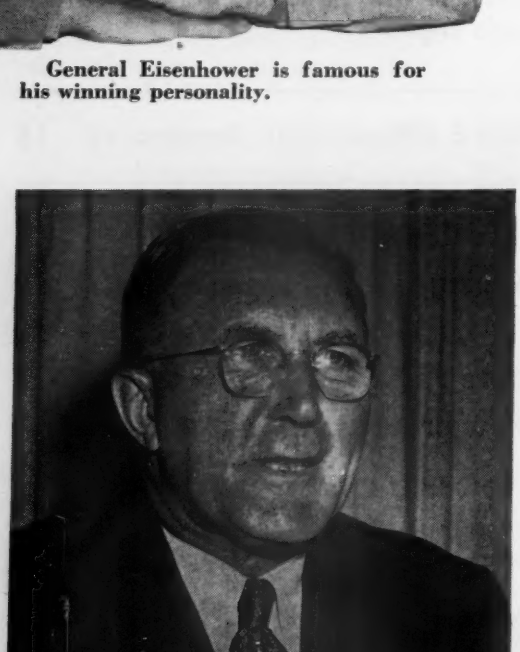
Industrial psychologist Dr. Henry C. Link, left, has written many best-selling books. His latest, *The Way to Security*, contains the thought-provoking statement quoted on the opposite page. It will interest NSPE members to learn that General Motors distributed 210,000 copies of Dr. Link's work in pamphlet form, to its employees. The Ford Motor Company distributed one of his books, 10,700 copies, to its supervisory force.

General Eisenhower is famous for his winning personality.





U. S. Representative Carl Hinshaw, left, (R-Calif.) a prominent engineer mem ber of the House, knows the value of being able to get along with people. On th right is Charles E. Wilson, a man who went to the top in a huge industry.



Three successful men. Above: Eric Johnson ran the motion picture industry before going into government service. Left: General Electric's Charles E. Wilson, now chief of the defense program, started at the bottom but soon went on to great heights. Right: Senator Taft, though outspoken and direct, retains popularity. Is popularity needed for success?

The Professional Engineer?

Compiled By
DAVID A. HELLER,
Staff Writer

Few Engineering Schools Teach Courses in Personality Development, but Here Is What Noted Industrial Psychologist Dr. Henry C. Link Has to Say About It: "So Far As It Affects Security, A Good Personality Is More Important Than A Good Mind." Do You Agree? Read What A Panel of Seven Prominent Engineers Think About the Place of Personality In the All-round Development Of An Engineer.

IN his book, *The Way To Security*, industrial psychologist Dr. Henry C. Link poses a challenging statement. Citing the case of a "brilliant young engineer," he says: *"So far as it affects security, a good personality is more important than a good mind.* During many years of aptitude testing, one of our most frequent experiences has been with individuals whose minds were good but whose personalities were weak. Typical is the case of a young engineer who had been out of school five years and expressed his difficulty as follows:

"'At graduation I was the second highest man in my class of one hundred and ten. Today, five years later. more than half of my class are ahead of me in salary, or in position, or in amount of responsibility. Why? I think I must be in the wrong line of work.'

"Our tests and inventory of his life history showed that his weakness was entirely a matter of personality. Therefore, we recommended that he undertake a program of social and physical activities, which we outlined in detail. These activities were of a kind that would help him develop a new set of habits in dealing with people.

"Several years later this young engineer returned to tell us of his progress. He had followed the program agreed upon consistently. 'I came to tell you,' he said, 'that I am still with the same company and have just received my third promotion. I feel sure that I am now on the right course.'

"This case is typical of many in our psychological counseling where the individual thought it necessary to find a job more suited to his mental aptitudes, but where the real problem was one of personality."

In his famous book, *How To Win Friends and Influence People*, Dale Carnegie says:

"For many years, I conducted courses each season in the Engineers' Club of Philadelphia, and also courses for the New York Chapter of the American Institute of Electrical Engineers. More than 1,500 engineers have passed through my classes. They came to me because they finally realized, after years of observation and experience, that the highest-paid men in the engineering field are frequently not the men who know the most about engineering.

"One can, for example, hire mere technical ability in engineering . . . The market is always glutted with it. But the man who has technical knowledge *plus* the ability to express his ideas, to assume leadership, and to arouse enthusiasm among men — that man is headed for higher earning power."

Mr. Carnegie reports that studies made at the Carnegie Institute of Technology revealed that about 15% of an individual's success in engineering is due to technical knowledge and about 85% is due to "human engineering" — to personality and the ability to lead people.

What can one do to develop a good personality? What part does personality play in the success or failure of a professional engineer? Besides, aren't engineers members of a traditionally "modest" profession anyway?

The AMERICAN ENGINEER has asked Dr. Link and a panel of seven members of NSPE, all successful engineers, to comment on the role of personality in the professional success or failure of an engineer.

Let's return to Dr. Link:

"Psychologists have discovered that personality is something that can be acquired by practice," Dr. Link says. "The popular opinion for many years was that personality is a kind of magnetism or charm which some people just naturally have, others not.

The Panel...

L. to r.: Tunnel designer Ole Singstad; Col. Chester Lichtenberg, retired GE engineer; Sidney Stolte, St. Paul consulting engineer.

"We now find that personality consists of abilities that can be learned like other abilities. We know that the mind, no matter what it is by inheritance, learns the three Rs by practice. So almost every individual, no matter what his heredity, can acquire the habits of a good personality. Equally, every individual, no matter how good his heredity, can fail to develop a good mind or a good personality through lack of industry and practice.

"Personality has been variously defined. My definition of personality is measured by the extent to which the individual has developed habits and skills which interest and serve others.

"We must interest and serve others in winning and keeping friends, in earning a living, in winning advancement, in raising a family, in making a place in the community. The primary emphasis of this definition, it will be seen, is not on salesmanship, not on conversational brilliance, not on getting the better of people. Its emphasis is on doing things with and for other people, on self-sacrifice rather than on pleasing one's self."

What do our panel of experts, successful engineers themselves, think about the part personality plays in the success of an engineer?

Let's lead off our comment with Dr. David B. Steinman, first President of the National Society of Professional Engineers, and generally conceded to be the world's greatest living authority on bridges:

Dr. Steinman says:

"In the first place, I object to the use of the word 'security' to represent what we are striving for. 'Security,' identified with paternalistic government, has come to connote everything that is the opposite of courage, enterprise, self reliance, and the spirit of the pioneer.

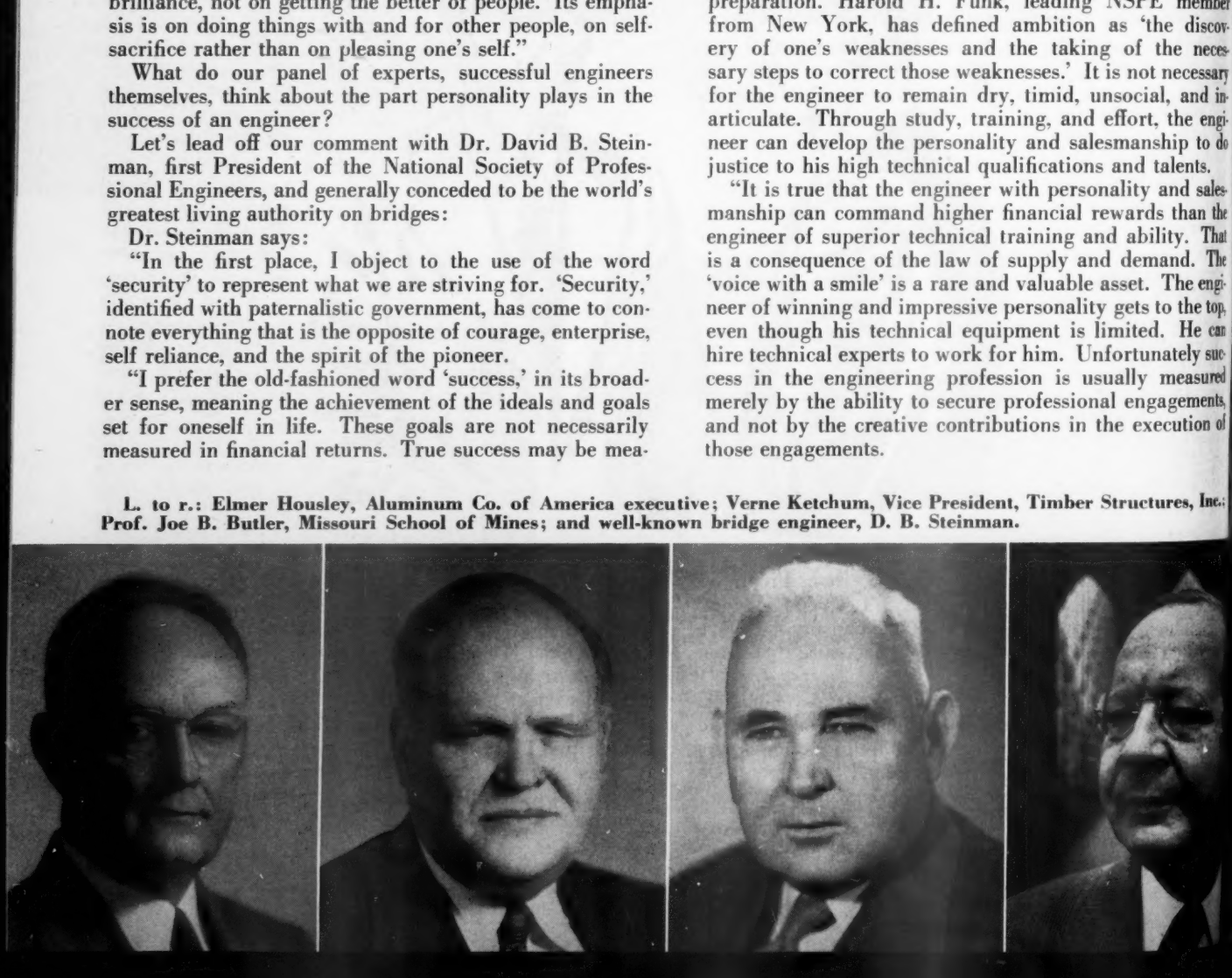
"I prefer the old-fashioned word 'success,' in its broader sense, meaning the achievement of the ideals and goals set for oneself in life. These goals are not necessarily measured in financial returns. True success may be measured in useful accomplishment, recognition, intellectual and esthetic satisfaction, happiness and friendship and, above all, the feeling that you have utilized your talents to the utmost and that you have won the warm esteem of your fellowmen.

"In the attainment of your objectives, in addition to character, ambition, educational preparation and intellectual equipment, a certain amount of salesmanship is required. You have to sell your abilities and talents to the world in order to win the opportunities for accomplishment. This salesmanship includes not only a pleasing personality, but also the essentials of conviction, enthusiasm, eloquence, and human psychology. Some of these qualities may come naturally, but all of them can be developed and strengthened by conscious effort, study and application.

"Unfortunately, engineers as a rule have not been conscious of these requirements to supplement their technical preparation. Harold H. Funk, leading NSPE member from New York, has defined ambition as 'the discovery of one's weaknesses and the taking of the necessary steps to correct those weaknesses.' It is not necessary for the engineer to remain dry, timid, unsocial, and inarticulate. Through study, training, and effort, the engineer can develop the personality and salesmanship to do justice to his high technical qualifications and talents.

"It is true that the engineer with personality and salesmanship can command higher financial rewards than the engineer of superior technical training and ability. That is a consequence of the law of supply and demand. The 'voice with a smile' is a rare and valuable asset. The engineer of winning and impressive personality gets to the top, even though his technical equipment is limited. He can hire technical experts to work for him. Unfortunately success in the engineering profession is usually measured merely by the ability to secure professional engagements, and not by the creative contributions in the execution of those engagements.

L. to r.: Elmer Housley, Aluminum Co. of America executive; Verne Ketchum, Vice President, Timber Structures, Inc.; Prof. Joe B. Butler, Missouri School of Mines; and well-known bridge engineer, D. B. Steinman.



"The individual engineer may make his choice — financial success through salesmanship and promotional ability, or professional satisfaction through higher scientific qualifications and original contributions. Perhaps the ideal solution for the professional man is the combination of the two—achieving both inner satisfaction and financial rewards by combining true engineering ability with personality development. A professional man should have something outstanding of his own to sell as well as the ability to sell it."

Social contacts offer the opportunity to learn about people.

Our next comment comes from Colonel Chester Lichtenberg of Fort Wayne, Indiana, Vice President of NSPE from the Central Area, who has had a distinguished career in industrial engineering with the General Electric Co., Colonel Lichtenberg, recalling events from his experience, says:

"Michael Idvorsky Pupin and Charles Proteus Steinmetz were two leading engineer-scientists a generation ago. Both rose to the highest honors and achievements in their respective fields. They were contemporaries. I worked for both of them sequentially. I knew them intimately.

"Pupin was the inventor of long-distance wire telephony. Steinmetz was famed for his analysis of the design of electric induction motors. Pupin had a most pleasing personality. Steinmetz was an arch-introvert and most difficult to get along with. Yet both were at the top of their profession.

"When it comes to engineers, and particularly Professional Engineers, my experience indicates that a good mind and a good personality are both necessary. They are the fraternal twins of character in an engineer. An engineer with a good mind but a poor personality is handicapped. Likewise, an engineer with a good personality but a poor mind is handicapped. Neither will be as successful as one who possesses both.

"Now how should an engineer with a good mind, but a poor personality improve his personality?

"If the engineer is young and impressionable, there are at least three ways in which he can improve his personality. He can join a 'Toastmasters Club.' He can learn the art of smiling. He can learn to emphasize the good attributes of his associates.

"The 'Toastmasters Club,' if composed of a diversity of personalities with diverse occupations, will give the young engineer a wonderful opportunity to learn to think on his feet, to quickly analyze a problem and find an appropriate answer, and to learn how to associate successfully with others.

"The art of smiling, not grinning, will aid the young engineer to practice self-control, to ease the tensions in his body, and to think clearly in situations involving intimate association with others. The conscious effort that produces a smile, sends soothing impulses through the entire body and results in a kind of exhilarating relaxation in times of mental stress. Experience has taught me this useful relief.

"Emphasizing the good attributes of one's associates is a most helpful means of developing a pleasing personality. Instead of continually finding fault with others, notice the things that they do well and praise them for these things well-done. Even a 'boss' feels complimented if one of his associates, even one of his employees, appropriately expresses a compliment for a difficult task well-done. When one continually finds fault and criticizes, his perspective becomes warped and his personality suffers. When one seeks for good attributes, his mental horizon rises and he benefits in an improvement of his personality."

From Portland, Oregon, where the timber grows tall, comes Engineer Verne Ketchum, Vice President of Timber Structures, Inc., to offer some excellent tips on how to get ahead in engineering:

"To make progress towards success and security, the engineer must not only have the general good graces, he must also labor to erect an *engineering personality* that will attract and charm the beholder. State registration must be secured, technical societies are to be joined, subscriptions entered for professional publications. Lack of these things imposes a hardship that is detrimental to both skill and personality.

"One time not long ago, an engineer came to the writer for suggestions as to where he could secure a better position. A short discussion disclosed that he had no state registration or society affiliation, nor any particular attainment that would serve as a stepping stone to better things.

"He could be told only that, for the present, his chances for improvement were quite slim and that he should acquire those improvements which would increase his engineering stature and then seek the higher level. *All too often the individual himself, rather than the client or employer, determines the low ceiling of his accomplishments and sets the slow pace of advancement.*

"Improvements often must be made in times snatched from crowded schedules or not made at all. Eating a carried lunch may be economical, but luncheon engagements with others are a fruitful source of facts as well as food. They permit the exchange of old ideas for new. Attendance at dinners and meetings have a greater value

(*Continued on page* 30)

Speaking of defense, the author says that ideas alone can give us the vital margin of superiority in technological warfare, and ideas spring from basic research.

THE CASE FOR A NATIONAL SCIENCE FOUNDATION

BY DR. ALAN T. WATERMAN

Director, National Science Foundation

DOES America need a National Science Foundation?

How can the Foundation contribute to our strength in the present world crisis?

What are its immediate plans?

These are among the questions which have been asked by scientists and engineers about the National Science Foundation and the Editor of the AMERICAN ENGINEER has asked me to outline some of the aims and objectives of the organization. Here is the story to date:

Congress passed the National Science Foundation Act in the Spring of 1950. In November, a 24-man National Science Foundation Board was appointed, including among its members some of the most distinguished scientists, educators and research administrators in the United States. In April of 1951, the President appointed me to be Director of the Foundation and since that time, definite plans have been formulated to provide for two of our country's most critical needs in the field of science: (1), The shortage of scientific and engineering manpower, and (2), the inadequacies in fundamental scientific research.

In his budget message to Congress the President requested $14 million for the first year of operations of the Foundation. The House of Representatives reduced this amount by 98 per cent, from $14 million to $300,000; but the Senate in turn partially restored the cut to $6.3 million.

The final appropriation arrived at in conference was an intermediate figure, $3.5 million.

While this amount will not permit the Foundation to embark upon its two major programs to the extent originally planned, it will enable the Foundation to initiate an operating program as well as to per-

(*Continued on page* 14)

(Copy of Letter sent by NSPE to Senate Appropriation's Committee)

Honorable Kenneth McKellar,
U. S. Senate Committee on Appropriations,
Senate Office Building,
Washington, D. C.

My dear Senator McKellar:

The following is an expression of the officially adopted policy of the National Society of Professional Engineers in support of the appropriation of adequate funds for the work of the National Science Foundation. The National Society of Professional Engineers is composed of over 26,000 engineers engaged in the practice of every engineering specialty, and registered for professional practice under the law of one or more of the States and Territories. They are associated together in numerous chapters organized under the leadership of our 38 State Societies. Their announced purpose is recognition that service to humanity, state and nation is a fundamental purpose of professional engineering.

For that reason the National Society of Professional Engineers, whose members are well qualified by training and experience to recognize the merit and potential value of the National Science Foundation, strongly urges the Congress to provide sufficient money to that Foundation to carry out its vital objectives.

There is little need to rehearse the legislative history of Public Law 507 of the 81st Congress establishing the National Science Foundation. Everyone is familiar with the difficulties which had to be overcome before a measure suitable to obtain the proposed results, and yet acceptable to all, was finally passed and approved. The widespread, almost universal support of eminent scientists, educators and engineers, whose patriotism, ability and judgment were, and are, unquestioned, cannot have been forgotten.

We are facing a very real and vital danger. No longer can we depend, as we often have in the past, on the research scholars of foreign countries to provide the basic research from which we may produce the fruits of practical application. No longer can we afford the wasteful practice of duplicated or greatly overlapping research carried on simultaneously by those unaware of work being done elsewhere in the same fields. Only at great risk do we fail to maintain our inventory of scientific and engineering skills available to the nation's necessities.

The foreign research scholars are for the most part gone, casualties of the war or of economic conditions. Overlapping and duplicated research has become almost prohibitively expensive in terms not only of money but, more important, in terms of ability and skill. A complete, accurate and current inventory of our scientific and engineering manpower is imperative if we are to make the best possible use of this severely limited and important part of our total national resources.

The importance and extent of the values of applied research are apparent to all our citizens. The fact that these values cannot be obtained in the absence of basic scientific work is perhaps not so immediately apparent. It remains true, however, that the major advantages in comfort, convenience and high standards of living enjoyed by our people could never have been achieved without the vital preliminary and basic work in fundamental scientific research. Our country's engineers, have in many cases and in many ways contributed to that basic research, and are well aware of its worth. They are in addition perhaps more aware than many of their countrymen of the value of basic research, since it falls to them—the engineers—to take the newly discovered principles and apply those principles for the use and benefit of mankind. How well this task has been carried out to the present day is best evidenced by the fact that with but a small fraction of the total world population, the United States possesses 58% of the world's telephones, 76% of the world's automobiles, 31% of the world's radio and television sets and 40% of the world's electrical production. These are only a few of many comparable figures. To take advances in basic science away from the professional engineer is to handicap him almost irretrievably in his chosen work of adopting scientific principles for the welfare of all. If war, as is the fervent hope of us all, does not come, the newly discovered principles which will be established will provide the basis for engineering adaptations leading this country and the world to a better and more abundant life.

And yet we cannot be unmindful of today's chaotic world conditions. We must be prepared to face the possibility of even more serious world dislocations. In that event, we must be ready to face what comes with all the resources at our command, and we must begin at once to supply ourselves with these resources. Chief among these is basic scientific research. Applications in the field of atomic energy, so rapidly developed in World War II, would have been impossible without basic scientific research, the implications of which first became apparent in mathematical equations of 20 years earlier, the roots of which went back to basic speculations of at least a generation earlier. Applications in the field of bacteriology and pathology, the full implications of which are only now being realized, must go back for their foundations to the fundamental work of Pasteur, Virchow and many others before and since. This is true of every scientific and engineering field.

In terms of our national budget, the amounts needed for the continued effective functioning of the National Science Foundation are small; the potential value, great. As individuals we believe that a man is well advised to set aside a small part of his income to pay for insurance against the possibility of a future devastating and disastrous loss. Can we as a nation afford to be less provident? It is believed that failure to supply the National Scientific Foundation with funds necessary to its work represents a short-sighted policy which we, as a nation, can ill afford to follow.

The National Society of Professional Engineers, therefore, urges that adequate funds be provided by Congress for the important work of the National Scientific Foundation.

Respectfully yours,
/s/ Paul H. Robbins,
Paul H. Robbins, P.E.,
Executive Director.

Foundation

(*Continued from page* 12)

form its planning functions in regard to national research policy. Here I should briefly like to describe the principal programs of the Foundation in order—first, the plans so far developed for support of basic research.

Support of Basic Research

Research support has an enormous bearing on the emergency. Today, the time-lag between the discovery of a basic scientific principle and its exploitation and application has all but disappeared in great technological areas, many of significance to defense. In field after field—aircraft design, jet engine metallurgy, guided missile development, liquid fuel production, military medicine, atomic power—technical progress is seriously delayed by lack of basic knowledge.

No one questions that the United States must absolutely maintain supremacy in scientific progress. To do this, we must establish a "defense in depth" in research and development. This means we must mobilize all of our technological resources—basic research, applied research, development, engineering and production know-how. Ideas alone can give us the vital margin of superiority in technological warfare, and original ideas spring from basic research.

We dare not forget the lesson of the last war. In 1940 the Nazis stopped their research. They thought the war could be won on weapons and warfare devices already developed and in production. Three years later they tried desperately to restore a strong research effort. It was then too late. They missed three of our most important military assets: microwave radar, the proximity fuse, and the atomic bomb.

Some of the specific plans of the National Science Foundation may be of interest to the members of the National Society of Professional Engineers for they offer new and challenging fields to the engineer. Without proper engineering, none will be capable of attainment.

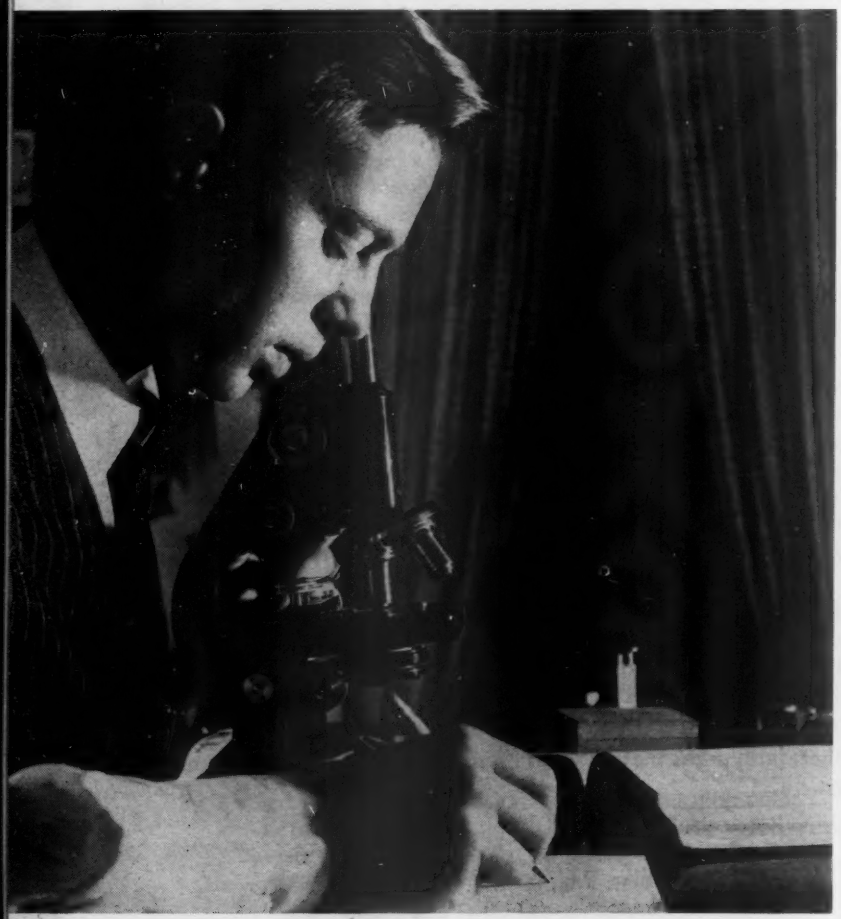
Basic Research for Defense

In the field of the physical sciences, basic research offers the only means of completely successful achievement in the following problems: the perfection of a fully effective guided missile, the design and performance of planes and missiles in supersonic flight and at very high altitudes, the development of substitutes for critical materials such as wool, electric insulating materials, quartz and such metals as cobalt, nickel, manganese and tungsten. Especially needed are substitutes for critical materials to stand up under the high temperature performance of jet engines. Basic research in physics and metallurgy will furnish the leadership which development must have in this area.

A recent development of importance in structural engineering came from basic research in metallurgy, i.e., the study of the properties of titanium. Titanium is reasonably light and superior in strength to any of the light metals or alloys. It is superior in corrosion resistance and in withstanding high temperature. It is also a very common metal. But more research is needed to develop cheap and easy quantity production. Basic research can be of major assistance in solving this bottleneck.

Solar Energy

Every modern nation today requires an adequate supply of power. The world has three main sources of power: organic, fuel, water, and inorganic or atomic fuel. With the exception of water power, these supplies were formed



No one knows better than the engineer that three of our most important military assets of the last war, microwave radar, the proximity fuse, and the atomic bomb, came out through intensive research.

and stored up in the far distant past. Coal, oil and uranium are restricted geographically and limited in amount.

For many years a major goal of science has been the development of means for storing solar energy. Significant advances have been made recently in understanding this process in living plants. Still more recent research has shown that solar energy may be trapped in the test tube by means of known chemical and enzyme systems, although still in the presence of living cell particles. The means by which these green particles absorb the energy to activate the rest of the system is still the most important and mysterious part of the process. Such research will be supported by the Foundation. Success in this undertaking, if achieved, will ultimately permit mankind to use synthetic materials to store energy from the sun. It is thus possible that in time the human race, if it wishes, may become independent of the stores of fuel in the earth. The magnitude of solar energy may be realized from the fact that, when the sun is overhead, each square mile of the earth's surface receives about four and one-half million horsepower.

New Sources of Food

A SIMILAR case may be made with regard to new sources of food. Man's present food comes from plants and animals, the latter depending in turn ultimately on plants. Much of the life in the oceans feeds upon omnipresent algae which grow in water under influence of the sun. Under controlled conditions in the laboratory, research on the growth of algae in water has already shown how to produce nutritious crops whose yields per acre are several times those of the best farm crops. The National Science Foundation plans to continue to support this type of basic research.

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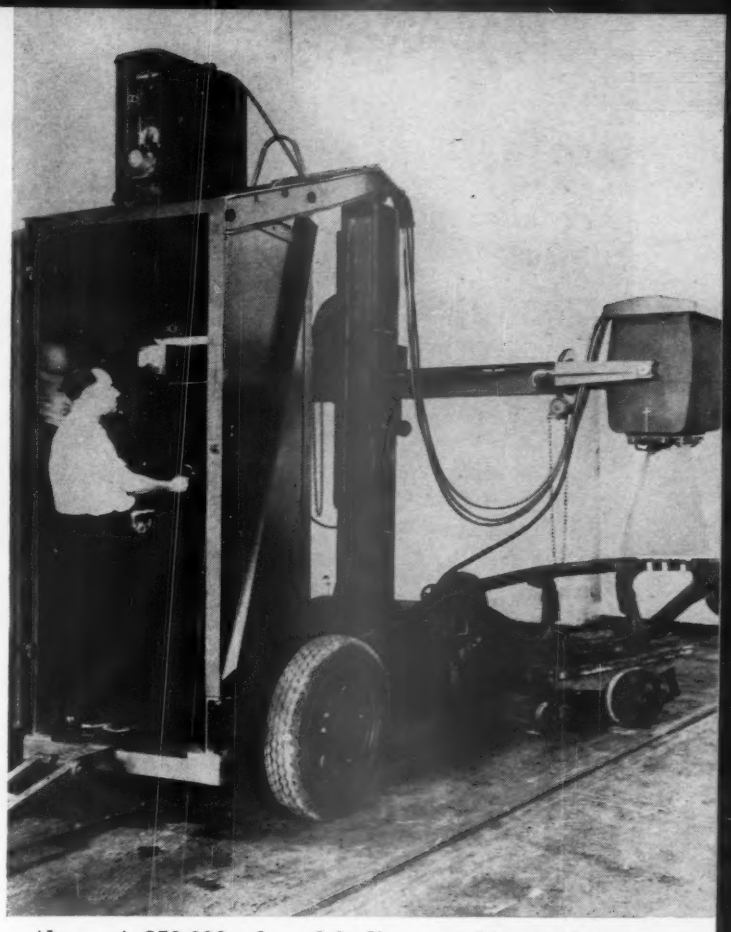
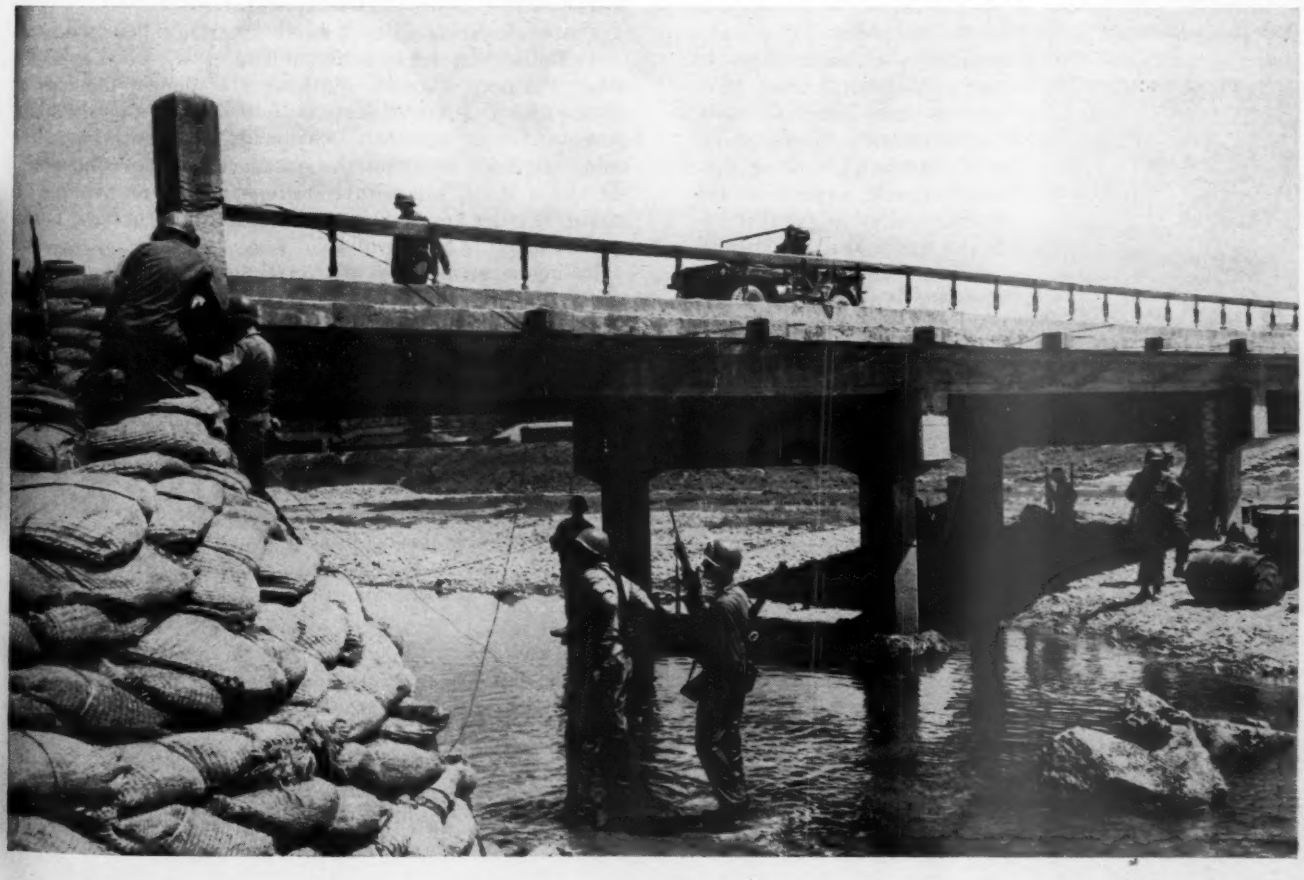


Above: A 250,000-volt mobile X-ray machine is shown in operation. Used by industry in its laboratories, it helps discover defects in new products and speeds them into production.

Scientific research and engineering application, have made our troops the best equipped in the world.

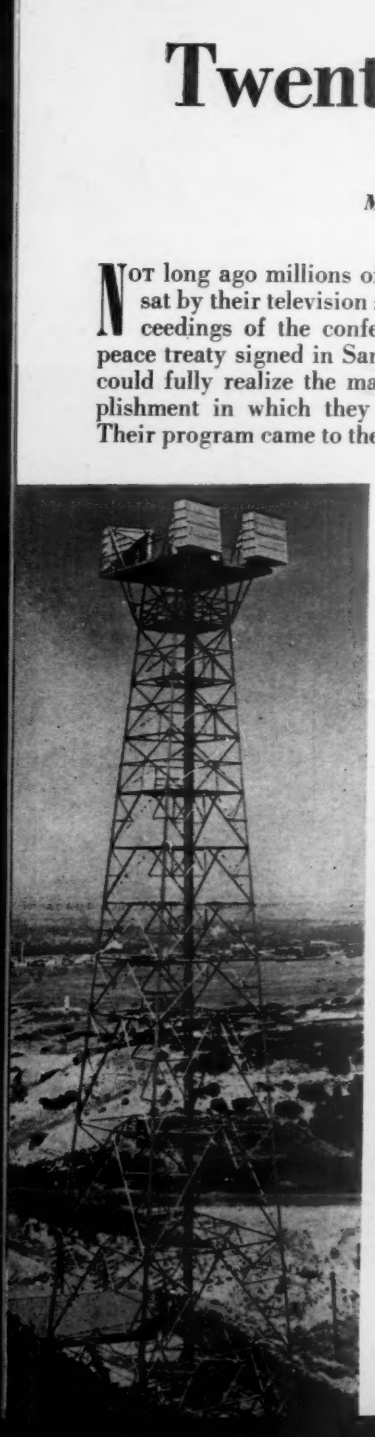


The Cisco-Butte, California, station of the transcontinental Radio Relay System. This station is located in a valley high in the Sierra-Nevada Mountains.

Twentieth-Century Pony Express

By FRANK W. SHELTON, JR., P. E.,
Member, NSPE, and American Telephone and Telegraph Co. Executive

Not long ago millions of Americans from coast to coast sat by their television sets interestedly viewing the proceedings of the conference negotiating the Japanese peace treaty signed in San Francisco. Few of the viewers could fully realize the magnitude of the scientific accomplishment in which they were privileged to participate. Their program came to them by courtesy of an engineering project near miraculous in scope. At the dedication ceremonies for America's new coast-to-coast radio relay system, operating on micro-wave signals, several of the speakers drew a parallel between the newest advance in communication engineering and the pony express riders of a century ago.



In many ways, the comparison is an apt one. Both operate on the same basic principle — relay stations. Each, in its time, has been recognized as the latest advance in communications. The express riders and their gallant horses, operating in relays, raced from outpost to outpost to carry the mail to San Francisco. Our 20th century pony express, a series of micro-wave relay stations built by the Long Lines Department of the American Telephone and Telegraph Co., does the same thing.

Like the horses of 100 years ago, our micro-waves of today also get "tired" during the sprint from relay station to relay station. The electrical ponies get "pepped up" by being amplified almost one million times at each relay station. Rejuvenated, they are instantly off on the swift journey to the next relay station.

The engineering story behind America's new coast-to-coast radio relay route is as colorful as any cowboy saga about the pony express. Built over a span of more than three years at a cost of forty million dollars, and although developed and constructed primarily to handle long distance telephone messages, the system relays television along the chain of 107 microwave stations, spaced an average of about 30 miles apart. One terminal station is at New York, and the other in San Francisco.

Initial construction work on the transcontinental system started late in 1947. Starting at New York, the Long Line's engineers and construction crews swung down near Philadelphia, from there westward across Pennsylvania to Pittsburgh, Cleveland and Chicago. From the Windy City the trail of relay stations travels west to Omaha, Denver, over the Rockies and the Great Divide, to Salt Lake City, and over the Sierra Nevada Mountains to California.

Over precipitious mountains, fertile farm country, arid deserts, through the centers of great cities the chain of steel and concrete towers zigzags its way three thousand miles across the American continent.

At many points, the radio relay highway follows trails by our country's early pioneers—taking them in some instances for the same reason the pioneers did, because they were the most accessible passes across mountain ranges and the most convenient way across the plains and deserts.

The principal difference between the existing transcontinental communication systems and the new radio-

◀ **Another one of the 107 stations on the Relay route. It's at Salt Lake City.**

relay system is the manner in which the waves carrying the messages are transmitted. Up until now, the waves have been guided along wires or within tubes. In the new system, the waves are projected as beams through space from relay point to relay point. Since the radiated beams follow straight lines, it is absolutely necessary to carefully select tower sites being mindful of possible obstructions between relay points.

The carrying waves are microwaves in the 4,000 megacycle range. Radio relay is not affected by static or lightning, or such man-made interference as is caused by automobile ignition systems, because these disturbances do not exist in the micro wave frequency range. Nor do the microwaves interfere with other radio or television programs being transmitted in their vicinity over other frequency ranges.

Microwaves used on the new relay system are about as long as a cigarette. Four billion of them pass a given point every second. Like light waves, microwaves travel in straight lines and do not follow the curvature of the earth. However, they can be focused like a searchlight and aimed from point to point so long as a clear line-of-sight exists between the stations.

Less than one watt—approximately the amount needed to light a pocket flashlight bulb—is all the power necessary to transmit the microwaves from one relay station to another. That is because the tiny impulses can be concentrated sharply into beams by use of unique lenses developed by the Bell System's engineering research laboratories.

The ability to aim the waves precisely has another advantage. It permits the economical use of frequencies assigned to carry television programs or telephone conversations by radio relay. The same frequency can be used for transmitting the waves of energy in different directions from the same station.

STATISTICS on the relay stations are rather interesting. The average distance between the stations is 28.2 miles, but they vary from 9 to 50 miles apart. The towers, not including antennas, vary from a height of only 30 inches on the Utah salt flats (the antennas were placed near the ground to avoid reflections from the flats) to a height of 427 feet at Des Moines, Iowa. The average height of the towers is about 125 feet. The antennas on top of the towers weigh about one ton each. The cost of the transcontinental relay system was approximately $40 million. Perhaps the most spectacular station is the one at Mt. Rose, Nevada, which is 10,075 feet above sea level.

The stations are not placed in a straight line, but in a zigzag manner. This is to prevent interference which might result if the signal transmitted from one station overshot the next station and was received at an antenna farther along the route.

Three key engineering advances have made development of the new radio relay system possible. Most important is an electron tube outstanding in performance at super-high frequencies. A greatly improved metal lens antenna and a unique system of filters are the other developments. The remarkable miniature vacuum tube which makes the system possible is a triumph of modern design. It is about an inch and a quarter high and its grid structure, for example, employs wire about one-tenth the thickness of a human hair. The distance between the grid and the cathode is one-fifth the diameter of a hair.

Square, horn-shaped directional antennas on top of each station concentrate the energy of the microwaves into narrow beams which carry the television programs or telephone conversations on their cross-country marathon.

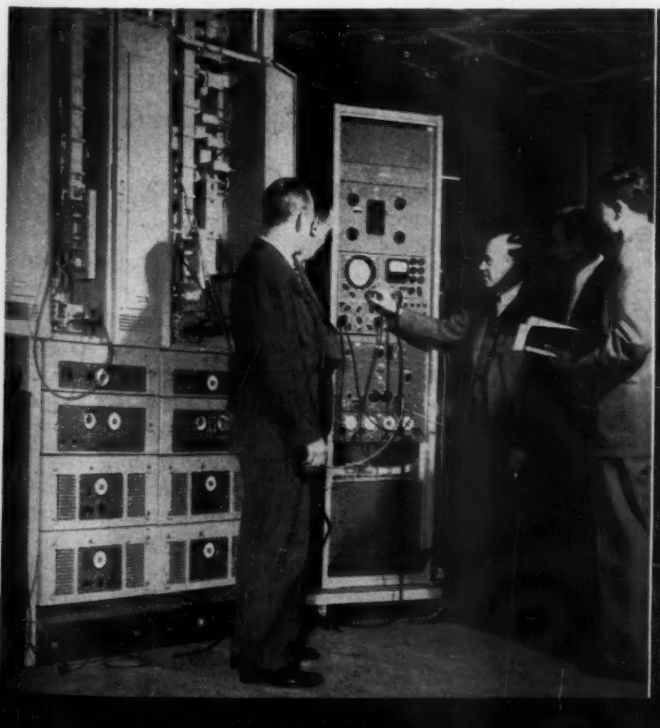
The final stage of the transmission is to "deliver the mail." This process involves a number of steps. First, converters "step down" the microwaves to lower frequencies used by regular telephone equipment and television stations.

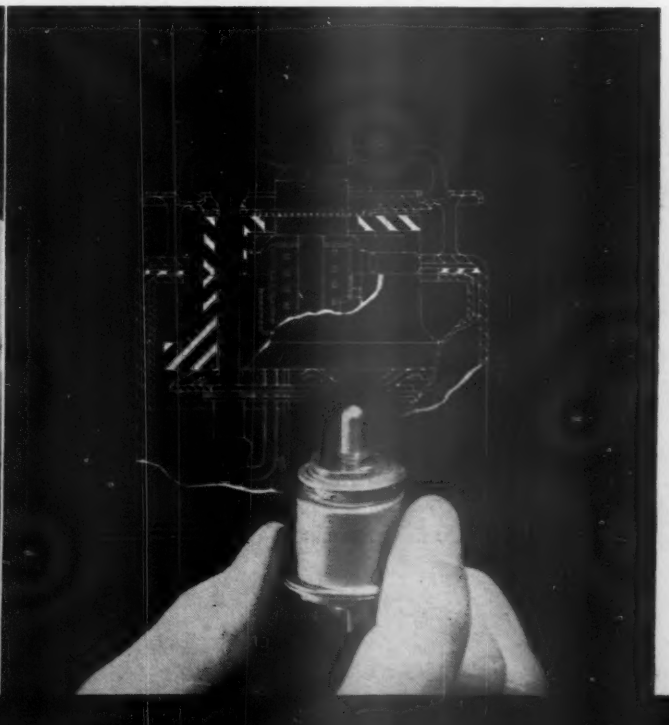
If the "mail" is telephone messages—which may number hundreds, as they only occupy narrow channels within the broad frequency band—electrical filters separate each individual voice channel within the signal between relay stations. Acting much like a radio dial tuning in a particular radio program, the filters segregate each individual message so that each is received where it is wanted. To "sort the mail," the type of equipment used on the radio relay is the same as that used on the coaxial cable.

Television messages are a bit more difficult to unscramble. The sound portion of a TV program normally travels over a different channel from the picture portion. Technicians at control centers coordinate these two parts of the program and picture and sound are dispatched to the television studio simultaneously.

With that action, the Bell System's "relay rider" comes to rest. his mission ended.

Engineers (left) inspect transmitter-receivers and testing apparatus at New York. Right: A new electron tube, outstanding in performance at very high frequencies and embodying several radical departures from ordinary electronic techniques, has been developed for radio relay systems by Bell Laboratories.





Committee Nominates Officers for '52

A WELL-KNOWN Midwesterner, prominent in National Society activities, has been named by the NSPE Nominating Committee to head the organization for the administrative year starting July 1, 1952. He is John D. Coleman, former NSPE Vice-President for the Central Area, present Chairman of the Ladies' Auxiliary Committee and previously active in many official Society offices.

Simultaneously, the Nominating Committee announced its candidates for the other National Officers of the Society.

In announcing its choices for the NSPE posts, the Nominating Committee pointed out that additional nominations may be made by the members, as provided in the Constitution. This provision states that additional names shall be placed on the official ballot upon petition of fifty members, all of whom must be in good standing, provided such petition is received at least one week prior to the printing of the official ballot. The closing date for such petitions will be December 10, 1951. They should be sent to the Washington office, NSPE.

This year's nominating committee includes: Engineers A. G. Stanford, Chairman; J. H. Buehler, Allan Craig, Gardner G. George, T. S. Thompson and Professor B. G. Elliott.

Shown below are the Nominating Committee's choices for Society leadership.

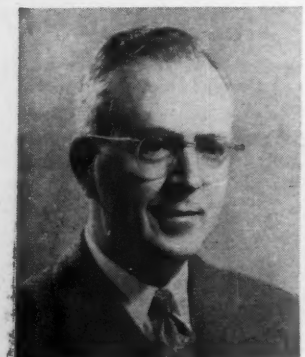
JOHN DAWSON COLEMAN, who has been nominated for the NSPE presidency, was born February 17, 1903, in Clarksburg, West Virginia, and spent his childhood there. Best known for his work in the Chemical and Industrial Engineering fields, he was graduated from the University of West Virginia in 1925 with the degree of B.S. in Chemical Engineering. He joined General Motors Corporation as a fuel research engineer the same year. After serving two years as a research engineer with the company, he became Production Engineer of the General Motors Export Corporation.

John Dawson Coleman

For the five years following his work as a Production Engineer, Coleman served as a Chief Chemist for the Fisher Body Division of General Motors. Continuing his long career with General Motors, he joined the Frigidaire Division of General Motors as a Manufacturing Methods Engineer, and later was promoted to the position of Assistant Supervisor of Manufacturing Research. During the war he served as Assistant Superintendent of the propeller plant which was operated by the Frigidaire Division. He is now Supervisor of Material Utilization, Frigidaire Division, General Motors Corporation.

Coleman is Past President of the Ohio Society of Professional Engineers, and served as National Society Vice President for the Central Area for the administrative year 1950-51. At present he is Chairman of the NSPE Ladies Auxiliary Committee. He has served as Chairman of the Ohio Chemist Committee on Professional Practices; has been both Vice Chairman and Chairman of the Dayton Technical Societies Council. Other local honors include Vice Chairman, Montgomery County Rural Zoning Commission, and Vice President of the Board of Trustees, Westminster Presbyterian Church.

He is a past chairman of the Dayton Section, A.C.S.



Clarence T. Shoch

CLARENCE T. SHOCH, who has received the nomination for Vice President of the Northeastern Area, is a graduate of the Drexel Institute of Technology, having received his B.S. in Electrical Engineering in 1924. He is also a member of Tau Beta Pi.

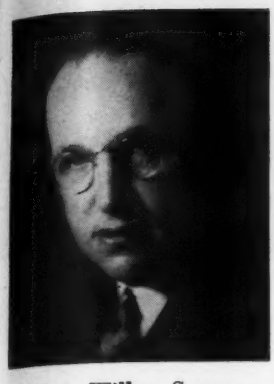
Employed July 7, 1924 by the Pennsylvania Power & Light Company as Instrument man, later he became successively Test Engineer, Field Engineer, Boiler-Room Engineer, Plant Bettermen Engineer, and Industrial Sales Representative. Since 1941 Mr. Shoch has been Manager of the Industrial Sales Department of the Company.

Mr. Shoch obtained his Professional Engineers' license in the State of Pennsylvania on July 22, 1931, and in 1937, became affiliated with the Lehigh Valley Chapter of the Pennsylvania Society of Professional Engineers and the National Society. He is now Chairman of the Legislative Committee of the National Society.

Dean N. W. Dougherty

DEAN N. W. DOUGHERTY, nominated for the Vice-Presidency of the Southeastern Area, was born at Hales Mill, Virginia, in 1886. He received a B.S. degree from the University of Tennessee in 1909, and a C.E. degree from Cornell University in 1913. In 1914, he was graduated with a M.C.E. degree from Cornell University. He is a member of Sigma Xi, Tau Beta Pi, Phi Kappa Phi and Chi Epsilon. Professionally, he has held membership in the A.S.C.E., A.S.E.E., A.A.A.S., Newcomen Society, Tennessee Academy of Science, Southern Association of Science and Industry, and N.S.P.E.

His offices have included Director, A.S.C.E.; Vice President and member of Council S.P.E.E.; Chairman, Tennessee State Board of Architectural and Engineering Examiners; and he is presently Chairman of the N.S.P.E. Education Committee. In addition, he is now serving as National Director of the Tennessee Society.



Edwin Wilbur Seeger

EDWIN WILBUR SEEGER, born in Bucyrus, Ohio in 1892, has been nominated for Vice President of the Central Area. He attended Ohio State University, and was graduated with the degree of M.E. in 1913. His college fraternities include Eta Kappa Nu, Triangle and Sigma Xi.

Since his graduation from college, Mr. Seeger has been associated with Cutler-Hammer, Incorporated. In 1928 he became Assistant Chief Engineer and in 1938 was made Chief Engineer, and became Manager of Development in 1939. In 1945 he assumed the post he holds today, Vice President in Charge of Development and Assistant Secretary.

Seeger has received approximately 100 patents on electro-magnetic devices and control systems, and his work "Design of Electro-Magnets & Induction Coils" was published by the American School of Correspondence in 1920. He has also contributed editorially to several magazines.

His organizational activities include: Fellow A.I.E.E., Chairman, Milwaukee Section, 1929-1930; Vice President A.I.E.E. District No. 5, 1948-1950. His offices in the Wisconsin Society of Professional Engineers include: 2nd Vice President, 1944; 1st Vice President, 1945; President, 1946; National Director, 1947-1951. He received the Distinguished Service Citation from the University of Wisconsin in 1951.

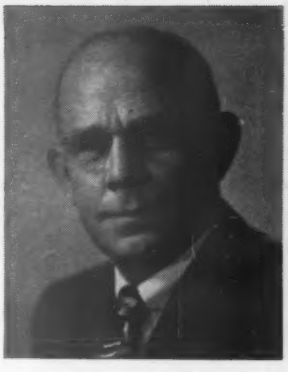
Christopher Y. Thomas

CHRISTOPHER Y. THOMAS, nominee for Vice President of the Northcentral Area, was born in Roanoke, Virginia, in 1900. He received his education at Purdue University, having received his B.S. degree in 1921 and his M.E. in 1926.

Upon his graduation from college, he became an apprentice instructor with the Atchison, Topeka and Santa Fe Railroad for three years, and then became supervisor of apprentices with the K. C. S. Railroad. In 1928 and 1929 he was Chief Locomotive Inspector for this company, and then served as Mechanical Engineer with the Pittsburg & Midway Coal Mining Company from 1929 until 1936. He became Chief Engineer for the latter company in 1936 and retained this position until 1941. At that time he became General Manager for the Military Chemical Works (predecessor of the Spencer Chemical Company). In 1946 he became Vice President of the Spencer Chemical Company, a position which he still holds. He is also a director of the Spencer Company and the Mineral Products Company.

Among the offices he has held are: President, Pittsburg Chamber of Commerce, 1942; Chairman, Kansas Engineering Council, 1947-51; Director, Kansas State College Research Foundation; Trustee, First Methodist Church.

He is a member of the A.S.M.E., American Society Testing Materials; American Institute of Mining Engineers; N.S.P.E., Kansas Society of Professional Engineers, and the Kansas Engineering Society.



T. Carr Forrest, Jr.

T. CARR FORREST, JR., who has been nominated for a second term as Vice-President of the Southwestern Area, was born at Forreston, Texas in 1896. He attended Trinity University and A & M College of Texas. Forrest has been engaged in private practice continuously since 1922, including such work as flood control and water conservation projects, industrial districts and many national defense projects during World War II. For the past 4 years he has been National Director of the Texas Society and is a Past President of the Dallas Technical Club. In addition, he is a Past Vice President of the Texas Section of ASCE and a Director of the Association of Former Students, A & M College of Texas. He is a member of the American Institute of Consulting Engineers, Society of American Military Engineers, American Waterworks Association and Tau Beta Pi.

William D. Williams

WILLIAM D. WILLIAMS, born in Hawkins, Pennsylvania, in 1900, has been nominated for Vice-President of the Western Area. He was educated at the School of Applied Science, Carnegie Institute of Technology.

During the last fifteen years he had been engaged in design and consulting practice and is presently associated with the firm of Headman, Ferguson & Carollo in Phoenix, Arizona on engineering investigation and design of water supply and sewerage projects throughout the Southwest. He was very active in the establishment of the Arizona Society of Professional Engineers, is a Past President of that organization, and currently holds the office of National Director.

Russell B. Allen

RUSSELL B. ALLEN has been named for a fifth time to serve as Treasurer. Raised in New Haven, Connecticut, Allen received his B.S. in Civil Engineering from Yale in 1923. His association with the University of Maryland began in 1933. In 1945 he was given the title of full professor.

Registered both in Maryland and Connecticut, Allen has been active in the affairs of the Maryland Society, was Secretary - Treasurer from 1938 to 1940, President from 1941 to 1943 and a National Director of NSPE for a number of years.

He has been President of the Executive Committee of the Maryland Chapter of the American Association of University Professors; is a member of Phi Gamma Delta, Society for Promotion of Engineering Education, and American Concrete Institute.

PLANNING FOR "A RAINY DAY"

The millions who attended the performances of the great Broadway success of "Show Boat," both on the stage and movies, have never had the tragic lyrics of the hit song "Ole Man River" brought home to them, unless they have personally experienced the torments of a great flood.

Since the stinging reality of the music has been impressed upon the citizens of Kansas and Missouri, it is safe to conjecture that after the hysteria and confusion of the disaster dies down they will wish action, something done to avert another recurrence of the stalking rivers, bringing terror to communities.

It is going to require cool, calculated thinking on the part of federal, state and local officials to bring about effective flood control, devoid of politics, and the special interests of a few. It places an enormous responsibility upon the men in office who must make this gigantic decision. Counsel and advice from an unbiased source could be an indisputable asset. Such a well of supply is available in the state of Kansas. It is her professional engineers. These men have several hundred years of accumulated experience in their background solving vital problems of flood control, construction of dams, study of run-offs and other related fields, which are everyday tasks with them. They can contribute greatly in lending their knowledge to the future flood control project.

These men can be obtained by a mere invitation to serve and their time will be given freely without expense to the taxpayer, a bargain to say the least.

The Kansas Society of Professional Engineers, Kansas Section of the American Society of Civil Engineers, the Kansas Engineering Society, the County Engineers Association all have local organizations in Kansas. Any one or several of the organizations or a combination of all could supply committees of engineers to serve in an advisory capacity with governmental officials. All that is required is the invitation from the proper authorities. The invitation would be accepted graciously and the enthusiasm to serve to help solve a vital problem would give heart to all those citizens now depressed and discouraged, lest it happen again.—*D. F. Joslin, Editor, Kansas Professional Engineer, The Topeka Daily Capital, October 1, 1951.*

LUSTRE OR GLITTER?

The metaphor of Frankenstein's monster has been overworked in discussions of the plight of mankind in the Age of the Machine, but it has validity in emphasizing that man is in danger of destruction beneath the wheels or in the disintegrating flash of his own creations.

The error in our thinking is in attributing to the Machine all the attributes of human beings or of God himself—the ability to choose between good and evil, to create, to destroy, to accomplish miracles. They are still subject to the will of man, and reflect in their accomplishments only the good or evil purposes of the men who operate them.

The Machine has had to share a place with the dollar above the altar of the materialistic among us. The Machine, of course, is the top-ranking god, for the dollar is in a very real sense the product of the machine. But we have placed much faith in the dollar to perform tasks for us.

We have achieved the world's highest standard of living; we have put together the world's most stupendous industrial system; we have only six per cent of the world's population, and only seven per cent of its area, but we account for roughly half of its industrial output. We have loaned and given away billions of dollars in cash and credit and foodstuffs and industrial machinery. We have given away still more billions in the form of the machines of war.

We have done all this, and what do we have to show for it? We have earned the bitter enmity of a good share of the world, an uneasy alliance with a smaller portion, and a close alliance with a very small portion. It is no wonder that we are beginning to question whether we are on the right track and beginning to ask whether we dare place our faith in machines, and in dollars alone. That gnawing wonder is to blame for a great deal of the insecurity that all Americans feel these days when we see our taxes mounting, the cost of living mounting, the piles of war supplies mounting, and no peak in sight for any of them.

It is axiomatic that he who claims the credit for a particular plan or process is liable for the blame if the plan fails or the process goes awry. The unthinking folk who loudly sang the praises of the scientists for making all our wonderful gadgets possible are quick to say the same scientists are to blame when they find that those gadgets are not all they had expected them to be. The fallacy of such thinking is obvious: the inventors, scientists, manufacturers and engineers are no more to blame for the miseries of the world than they were entitled to all of the credit when everything was going well.

Neither are the machines themselves to blame—the atom bomb is of no more importance than a grain of sand without man to direct its flight to the target and to time its detonation. The decisions lie in man, the thinking animal, not in the inanimate machines to which we falsely ascribed so many human attributes. To paraphrase the famous words of Shakespeare: "The fault is not in our machines, but in ourselves—all of us."

If our national feeling of insecurity is indeed attributable to a slackening national faith in material things, then I see great hope for America. Perhaps the American people will come in time to respect and honor—and reward—those who produce thoughts and ideas as well as those who produce things.

George Boas, the eminent professor of philosophy at the Johns Hopkins University, pleaded a strong case for the humanities and the social sciences recently at a symposium on Higher Education and Long-Range National Security. He made the telling point that "when all is said and done, it is the philosophy and poetry and architecture and sculpture (of the cultures of the past) which have survived as dynamic forces."

He went on to decry the current attitude towards students in his own

and related fields, and made this comment:

"We are in a national situation where millions are being spent daily on studies the results of which will be weapons. The more deadly the weapons the better. Pure science is tolerated because it is suspected that it may contain implications useful for warfare. Psychology and economics are tolerated because it is hoped that the former may teach us how to beguile the enemy successfully into treason or cowardice, the latter because it may teach us how to capture or destroy the materials vital to the enemy's defense. But the historian, the student of language and literature, and especially that human gadfly, the philosopher, are not encouraged. They are not essential to defense. They are merely essential to civilization."

I do not mean to advocate the liberal arts curriculum for everyone, or for education obtained by reading 100 great books. One must be alive to enjoy life, and most of us have to earn a living to stay alive.

Every man's life is a fairy-tale written by God's fingers.
—Hans Christian Andersen

But on the other hand, students coming under our guidance and control must be taught some things beyond mere technical competence in their professions. Specifically, it is not enough to teach engineering students engineering and related subjects and little else. They should not leave our colleges and universities with the mistaken notion that everything in life can be reduced to a mathematical formula, and their relations with their fellow men determined by slide-rule calculations.

But while we are broadening our courses to produce graduates who can honestly claim to be educated, we must narrow them too, in order that they may focus on some of the fundamental truths of which we have lost clear sight in recent generations. The glitter of modern civilization has obscured too much of the intrinsic values of such old-fashioned things as respect for the rights, persons, property and opinions of others. Teachers of whatever subjects would be serving well if they laid some stress on those fundamental principles of conduct for the benefit of their students. But most of all, I am sure you will agree, we must teach students to *think*.

There is ample historical precedent for the idea that a college student shall have training narrow enough to equip him to making a living and broad enough to equip him to make a life.

Determining just what that background and training should be is of course a task for individual teachers and individual colleges. But as a guide, we might remember that Milton more than three hundred years ago, in one of the best definitions of an education ever written, defined an educated man as one who can perform all the offices of peace and war with justice and magnanimity.

In the final analysis, an educated man in a democracy is one who is trained and conditioned to be an effective citizen. He need not necessarily be a man who has attained great wealth, or professional distinction, or high public office. He may not be known far beyond the borders of his own community.

If we will keep such definitions of education in mind, we as educators will not think so much of graduating engineers, or chemists or teachers, as of graduating educated men and women, trained to be effective citizens of our democracy—men and women ready and willing to assume the duties of leadership in a nation crying for intelligent direction, and guidance in a world full of confusion, insecurity and doubt.—*John A. Hannah, President, Michigan State College. The Journal of Engineering Education, September, 1951.*

THE TIES THAT BIND

In the attainment and preservation of just and good relationships throughout the world the questions to which the engineering profession must find satisfactory answers are: What has the engineer done to date? What is he doing right now; and what more can he do in helping to solve this tremendous and vital riddle? The quick answer to the last is simple indeed. First he must be a good engineer, secondly a good neighbor. It is my purpose, however, to look into the problem more closely in order to try to grasp at some of the salient facts.

The upsurge of scientific thought in the last three centuries, and the more intensive application of that thought in modern times have produced social and economic stresses that may be numbered amongst the contributory causes of international disunity in recent years, culminating in two catastrophic world wars in the first half of this tragic twentieth century. It is true that with the advent of war the engineer is ready and prepared to serve his country in devising new weapons. If war should smite the world again the engineer will again respond to the flag with the same vigor as before. The effect of war, however, is to waste the world's resources in useless destruction and to create tremendous problems more difficult to solve than any confronting engineers in their normal work.

What barriers are there which stand in our way of assisting the world along the path to closer international understanding? Two principal barriers merit attention:

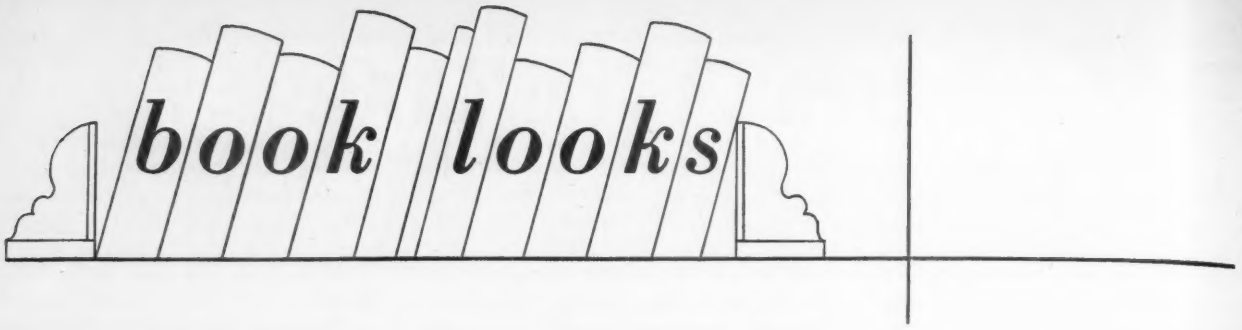
(a) The language barrier. Although the problem of transportation has been overcome by aerial navigation, freedom of speech is still limited by the variety of languages, the legacy of past centuries of isolation. Gradually we are seeing this disappear as engineers have to do with materials, processes and laws which are not affected by national, racial and linguistic boundaries. Technical terms and formulae are common to all, but more than one language has to be learned in pursuit of wider engineering knowledge.

(b) The financial barrier. The most highly technically developed countries are those which possess the greatest engineering, manufacturing and constructional resources. They are only too willing to assist in the spread of engineering "amenities" in the backward areas. This, however, can only be done by long-term loans to the Governments of those areas to help in paying for the costs involved. Long-term loans are a successful feature in international relationships so long as mutual trust and goodwill abound, but when ideologies and basic ways of life are thrust into the forefront of international argument so it becomes increasingly difficult to plan ahead great engineering schemes in the more distant parts of the globe in the face of declining goodwill or good will that has already disappeared altogether.

So often do the spirits of great events stride on before the events, and in today already walks tomorrow.
—Coleridge

It is my belief that a major contribution by engineers to world understanding could be made by determining:

(*Continued on page* 31)



Title: Design of Insulated Buildings for Various Climates.
Author: Tyler Stewart Rogers.
Published by: An Architectural Record Book. Price: $5.50.

Buildings that truly meet their owner's requirements, that are functionally designed in the broadest sense, can only be created by men who keep pace with the new facts found by research and experience. Here is a book to help professional engineers do just that.

The book is divided into two parts, principles and practice. Included for consideration under principles are such topics as Climate, Heat Control, Vapor Control and Ventilation. Practice includes Design Data, Roofs or Ceilings, Walls, Floors and Design Calculations.

Title: Fundamentals of Atomic Physics.
Author: Saul Dushman.
Published by: McGraw-Hill Book Company, New York. Price: $5.50.

This book presents the essential concepts and applications of atomic and nuclear behavior, using only the most elementary calculus and emphasizing experimentally observed phenomena. The most recent advances including the development of atomic energy and the production of high voltage particle accelerators are comprehensively covered. Shows the application of the scientific method to atomic and nuclear problems and gives an understanding of the quantitative relations involved.

Title: What's the World Coming To? (Science Looks at the Future).
Author: A. M. Low.
Published by: J. B. Lippincott Company, New York. Price: $3.00.

In this book one of Britain's most distinguished scientific minds gives an astonishing and convincing picture of the life that you, your children and your grandchildren will be living during the next one hundred years. Professor Low, who has had an uncanny faculty for correct predictions in the past, discusses the possibilities of atomic power plants, electronic weapons, new penal codes, electronic factories without workers, rockets to the moon, artificial hearts, and food of the future. Written with the clarity and brilliance characteristic of the best British scientific writers since Huxley, the author has produced a completely intriguing and fascinating book.

"For every person in the past who has been too optimistic about future scientific development there have been a million who were far too pessimistic," writes Professor Low, a man who should know, for his own forecasts of 1925 have come true to an extraordinary extent, from atom-splitting to radio-controlled rockets and 700 m.p.h. planes—considered "fantastic" in 1926. For anyone interested in the future of scientific developments, and this certainly should include professional engineers, here is a brilliant, expert and admirably written book.

Title: Newsweek's History of Our Times.
Published by: Funk & Wagnalls, New York. Price: Two volumes, $12.00.

Here, in two great volumes, is the exciting story of the most crucial years in contemporary history—a vivid, authoritative account of the national and international events that are affecting our lives at this moment.

Written by crack reporters and interpreted by expert analysts, this fascinating two-volume set covers the significant developments in all important fields—business, labor, politics, religion, science, art, sports, et cetera.

As interesting and easy to read as *Newsweek* itself, "History of Our Times" is a completely rewritten, seen-in-perspective account of history-making happenings—an important, highly significant contribution to a better understanding of the personalities, the decisions, and the events that are changing our world, our nation, our very thinking.

Illustrated with an exceptionally fine selection of news and human-interest photographs—fully indexed, and beautifully bound in cloth—an invaluable reference work for your office or library.

Many sections will be of particular interest to the professional engineer, such as Mobilization, Steel, Automobiles, Housing, Aviation, Transportation, Consumer Goods, Production and Utilities.

Title: Occupational Outlook Handbook.
Published by: Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price: $3.00.

The second edition of the Occupational Outlook Handbook, issued by the Occupational Outlook Service of the Bureau of Labor Statistics, has been completely revised to show the effects of the defense mobilization program on employment opportunities in all industries and occupations described in the first edition. More recent data on earnings, training, and entrance requirements are given, and the new volume also covers 145 additional occupations and includes new chapters on industries—such as aircraft, shipbuilding, steel, and petroleum production and refining—which have become important to our national defense.

Broad framework of trends in population, industries and occupations is presented in introductory chapters as background material. The occupations in each industry are introduced by a discussion of its major characteristics and trends. Thus the Handbook is a practical guidebook to the bewildering array of occupations in the United States, rather than a mere collection of occupational briefs.

Trends and outlooks are emphasized to depict the changing nature of occupational and industrial life, and to help in long-range educational and career planning. Visual aids are used throughout. Trends and characteristics of occupations are shown in 85 vivid charts and 103 photographs. The Handbook should prove of great interest to engineering counsellors and educators.

With Our Members . . .

Cleveland Chapter Hears Talk On Engineer's Psychology

Dr. Richard Wallen of the Psychology Department of Western Reserve University told members of the Cleveland Chapter, OSPE, attending the September 21st meeting held at Tomlinson Hall, Case Institute, that the "typical" engineer will answer affirmatively to the following questions: "Are you an only child? Did you work summers before entering and during college? Do you attend church infrequently?"

Speaking on the *Psychology of the Engineer*, Dr. Wallen told of surveys that were made about the formative stages of engineers, doctors and lawyers. These tests showed that the "typical" engineer was an only child. His father was very often a professional man who liked to work with his son in various mechanical pursuits around the house.

From the tests it was discovered that summers were spent by future engineers in working in factories, as mechanics et cetera, whereas the doctor more often worked in a summer camp. The embryo engineer usually had his profession chosen before leaving high school. The lawyer, on the other hand, usually did not know until he was 21 years of age just what he would do.

Tests of graduate engineers indicated that a typical mechanical engineer for example, stood very high in mechanical science, computative ability and also art. Sales engineers had results similar and also stood high in persuasion. In each group, there was prevalent a deficiency in the social sciences, and engineers appear to be "interested in things, not people."

Lehigh Valley Chapter Of Pennsylvania SPE Holds Dinner Meeting

The Lehigh Valley Chapter of the Pennsylvania Society met on October 19 at the Elks Club in Allentown to hear Mr. C. C. Singleton speak on "Prestressed Concrete Structures." Mr. Singleton is Regional Structural Engineer in the Philadelphia Office of the Portland Cement Association.

His presentation of the subject was accompanied by slides which covered the development of prestressed concrete in Europe and the United States.

Wisconsin and Texas Members Nominated For ASHVE Offices

Ernest Szekely, P.E., member of the Wisconsin Society and President of the Bayley Blower Company of Milwaukee, has been nominated for president of the American Society of Heating and Ventilating Engineers in 1952, it was announced recently at ASHVE headquarters. Receiving the nomination for first vice president was Reginald F. Taylor, member of the Texas SPE.

Mr. Szekely is currently serving as first vice president of ASHVE. He was born on July 24, 1888 in Hungary and was graduated from the University of Budapest in 1910 with a degree in mechanical engineering. Before coming to the United States, Szekely was an assistant and later associate professor at the University of Budapest.

In 1912 he became associated with the Guarantee Construction Company of New York. Thereafter Mr. Szekely was successively employed by the American Blower Company, Detroit; Drying Systems, Chicago; Bayley Blower Company, Milwaukee. He became president of the latter organization in 1932.

Mr. Szekely in addition to his membership in the Wisconsin Society, is a member of the American Society of Mechanical Engineers, the Astronomical Society, Rotary International, Tau Beta Pi and Pi Tau Sigma.

Reginald F. Taylor, first vice presidential candidate, was born in Toronto, Canada and educated in England and South Africa. He came to the United States in 1908 from Canada and served with several architectural and engineering firms before opening his own office as a consultant.

Taylor is a member of the American Institute of Electrical Engineers, Rotary Club of Houston, Houston Engineers Club, Houston Club, Houston Electric Club and the Texas Society.

District Of Columbia Society Meets In Washington Recently

The District of Columbia Society met on October 22 at the Pepco Auditorium in Washington, D. C. Following a business meeting, a film in color entitled "Fishing in Alaska" was shown.

Building Code Committee Of Michigan Society Conducts State Survey

The Building Code Committee of the Michigan Society has completed a survey which it conducted on the status of Building Codes in cities throughout the state of Michigan having a population of 6,000 or more. The survey was made as a part of the Committee's policy to encourage the adoption of modern and uniform codes throughout the State.

This tabulation shows that 23% of the 82 cities surveyed do not have any code at all; and that 27% of the remaining cities have codes which have not been revised within the last 10 years. With a very few exceptions, all municipalities surveyed and having no codes or older codes are now considering the adoption of a code or the revision of their existing code.

It was also noted that, of the three nationally recommended codes which have been adopted by the surveyed communities to date, the Pacific Coast Code is predominant; but that of the communities considering new or revised codes, the trend of choice is decidedly toward the new Building Officials Conference of America Codes which were first published in the late summer of 1950.

As a result of its work with various communities during the last few years, the Committee has decided that the adoption of a nationally recommended code, modified to meet local requirements, offers the most effective solution to the building code problem. The Michigan Society's Building Code Committee under the chairmanship of N. O. Saulter, P. E., has offered its services to any Michigan community desiring its assistance.

San Jose Chapter Hears Meisling Speak On New Calculator

The San Jose Chapter of the California Society met on October 16 at the Science Building of the San Jose State College to hear Mr. Torben H. Meisling, Lecturer in the Electrical Engineering Department at the University of California.

Mr. Meisling did the development work on the electronic calculator now being used at the University of California, and he addressed the group on his work with the machine.

Mahoning Valley Chapter Host To Ohio District Conference Recently

The Mahoning Valley Chapter of the Ohio Society was host when the 1951 District Conference of the OSPE was held at the Youngstown Country Club on Saturday, September 15. Over 60 persons from all parts of the state attended the meeting, which was presided over by OSPE President Edward Larson.

OSPE Vice Presidents Raymond Freese, Cleveland, and Ronald A. Gordon, Wilmington, opened the meeting with discussions of unity and salary schedules respectively. The conference then divided into smaller groups according to committee activity interests.

At the noon luncheon, the out-of-town guests were welcomed by the Honorable Charles P. Henderson, Mayor of Youngstown. He spoke of the growing importance of engineers in the conduct of city affairs and in planning for the city's future.

NSPE Vice President C. G. Roush was the featured luncheon speaker, and he presented an address on the importance of good public relations to the engineering profession. Mr. Roush is Chairman of NSPE's Public Relations Committee.

Functional group meetings on "Engineers in Industry" and "Private Practice" were scheduled for the afternoon program, which concluded the conference.

A number of visitors to Youngstown were accompanied by their wives, and these ladies were entertained by the Women's Auxiliary of the Mahoning Valley Chapter.

OHIO DISTRICT CONFERENCE

Pictured above are two of the speakers who addressed the noon luncheon of the 1951 District Conference of the Ohio Society, which was held on September 15 at the Youngstown Country Club. TOP: C. G. Roush, P. E., Chairman of NSPE's Public Relations Committee, discusses public relations and its importance to the profession. BOTTOM: The Honorable Charles P. Henderson, Mayor of Youngstown, is shown as he welcomes the visiting engineers to the city.

Davis Inaugurated As Fourth President Of Stevens Institute

"Engineering and science, upon which engineering is based, are not static—they are powerful dynamic forces," said Dr. Jess H. Davis, P.E., member of the New York State Society, following his inauguration as the fourth president of Stevens Institute of Technology on October 12. "Engineering education, if it is to reach the utmost in true effectiveness, must also be dynamic, but to be dynamic its entire program must be reappraised soon. These reappraisals should be unbiased, to the extent that this is possible, and should be made with a view to the future with an ear to the past."

Dr. Davis continued, "One historical fact seems to stand out—that when changes in engineering education have been made they have usually been forced, and, if I interpret accurately, they have been late. What has been the cause of this? Complacency has undoubtedly played its part but I believe that one of the major causes has been that early engineering education, by necessity perhaps, was empirical in nature and that we have been too slow in substituting rational principles when they have been available. We have taught too many techniques and too few basic principles which can be applied to new problems.

"A second, and closely related cause, is that we have not carried our programs in science far enough. I do not mean that we should make every engineer a scientist, but should try to give him an education which shall enable him to follow the progress of science," Dr. Davis concluded.

Atlanta Journal Editor Addresses Atlanta Chapter

Mr. Wright Bryan, Editor of the *Atlanta Journal* addressed the Atlanta Chapter of the Georgia Society when they met at the Y. M. C. A. in Atlanta on October 15.

Bryan is the only Southern editor in a group of fourteen invited by the Departments of State and Defense to make a survey and report on the European Mutual Defense Assistance Program and to observe the related activities of NATO-SHAPE (North Atlantic Treaty Organization-Supreme Head Allied Powers in Europe).

Mr. Bryan's 13,000 mile itinerary took him to France, England, Germany, Turkey, Greece, the Low Countries, Italy and Yugoslavia.

General Somervell Addresses Banquet Of Pittsburgh Chapter

Speaking at the Annual Banquet Meeting of the Pittsburgh Chapter, PSPE, on October 18, General Brehon Somervell, Chairman and President of Koppers Company, Inc., and member of the Pittsburgh Chapter, PSPE, decried the fact that "a good many Americans have adopted, consciously or unconsciously, some of the modes and elements of typical Russian political thinking," and suggested the type of thinking done by engineers as an antidote to "illusory political and economic thinking."

The Banquet Meeting, held at the University Club of Pittsburgh, was attended by 450 professional engineers and their guests. Marcel M. Fertig, P.E., Chapter President, presided with Dr. A. E. Holbrook, NSPE Past President and retired Dean of Engineering and Mines at the University of Pittsburgh, acting as Toastmaster.

General Somervell, speaking "not as a General, Chairman or President, but as a Professional Engineer," called on all Americans to adopt the straight thinking of the Engineer to combat the present day economic "word twisters" who speak in words of symbolic American traditions and ideals, but give those words the exact opposite from their true meaning. Among such words are "capital," "enterprise," "profits," "liberty," "freedom," and "security."

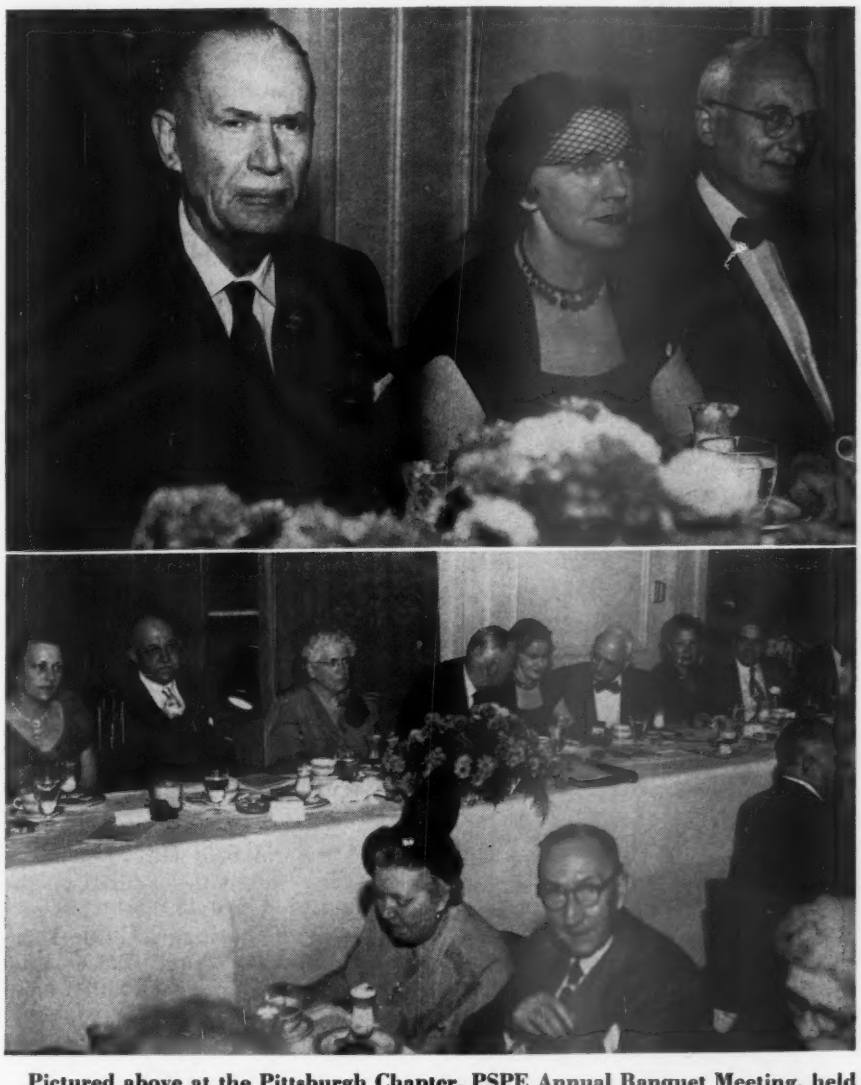
To combat the Russian type of thinking which he asserted is responsible for many of the national and international difficulties in which we currently find ourselves, General Somervell urged a return to the "engineering type of thinking — the recognition of facts for exactly what they are . . . and the utilization of facts and facts alone in working out national projects."

Junior Texas Rangers Trail Sabine Member For P.E. Information

L. V. Norris, P.E., member of the Sabine Chapter of the Texas Society, wondered why a car full of high school students were following him recently as he drove through the streets of Beaumont, Texas.

After following him for several blocks, they pulled up beside him at a traffic light. Puzzled by the T.S.P.E. sign on the back of the car, the younger generation wanted to know what "P.E." meant.

PITTSBURGH ANNUAL BANQUET



Pictured above at the Pittsburgh Chapter, PSPE Annual Banquet Meeting, held at the University Club of Pittsburgh on October 18 are, left to right, TOP: General Brehon Somervell, member of the Pittsburgh Chapter; Mrs. Marcel Fertig; Marcel M. Fertig, P. E., Chapter President. BOTTOM: General view of speaker's table. Dr. E. A. Holbrook, NSPE Past President; Mrs. Holbrook; General Brehon Somervell; Mrs. Marcel Fertig; Marcel M. Fertig, P. E.; Mrs. Robert A. Blackburn, Robert A. Blackburn, P. E., National Director, PSPE.

J. F. Lincoln Speaks To Detroit Chapter On Incentive Management

James Finney Lincoln was guest speaker when the Detroit Chapter of the Michigan Society met on October 10 at the Rackham Building.

Mr. Lincoln, President of the Lincoln Electric Company, in Cleveland, is best known for his work in management, which led to the development of the so-called "Lincoln Incentive System," which has been followed by the company with marked success. It was on this topic that Mr. Lincoln addressed the Chapter, titling his talk, "Incentive Management."

Kansas Chapter Hears Dean Wilson Speak At Recent Meeting

The Tri-Valley Chapter, K.S.P.E., met on September 29 at the Wareham Hotel in Manhattan. The featured speaker for the evening was Dean Curtis L. Wilson of the Missouri School of Mines, Rolla, Missouri.

His subject "Watch the Pronunciation" was taken from the biblical story of the Ephriamites who came to disaster because they mispronounced the word Shibboleth.

Preceding the Chapter meeting, the Board of Directors of the Kansas Society held an all day meeting in the Gold Room of the Wareham Hotel.

News To Note

New Jersey

Thirty-six members belonging to the Monmouth-Ocean Chapter of the New Jersey Society met for dinner on October 9 at the Crystal Brook Inn, Eatontown, New Jersey.

Guest speaker Stanton C. Funk, Chief Construction Engineer, New Jersey Turnpike Authority, was introduced by George Ritter, P. E. Mr. Funk told the engineers of his experiences in working on the Pennsylvania Turnpike several years ago.

Texas

The Galveston County Chapter of the Texas Society met on October 15 in the Commissioners Court Room of the Galveston County Court House for a business meeting.

Massachusetts

N. W. Dougherty, P. E., Dean of Engineering at the University of Tennessee, spoke on "Registration and Its Relation to Professional Status" at the meeting of the North Shore Chapter of the Massachusetts Society which was held on October 22 at the West Lynn Works Auditorium of the General Electric Company.

Wisconsin

The Milwaukee Chapter of the Wisconsin Society held a dinner meeting on October 9 at the ESM Building. Mr. Harry Brockel, Municipal Port Director of the City of Milwaukee addressed the group on "Milwaukee — World Port."

West Virginia

The Appalachian Chapter, WSPE, met on October 8 at the El Chico in Beckley. Rabbi Abraham I. Shinedling of the Beth El Congregation, Beckley, was the speaker. His subject was "A Survey of Public Morals in the Past Decade."

California

The Los Angeles Chapter met on October 15 at the Rodger Young Auditorium to hear Mr. Paul H. Robbins, Executive Director of NSPE, discuss "NSPE Affairs, Activities and Programs."

Ohio

The Franklin County Chapter, OSPE, met on September 25 at the Fort Hayes Officers' Club to hear Mr. William Radcliff speak on some of the interesting experiences of Benjamin Franklin. Mr. Radcliff is President of the Third National Bank of Circleville, Ohio.

Pennsylvania

The Northeast Chapter of the PSPE held a dinner meeting on October 26 at the Fox Hill Country Club at West Pittston, Pennsylvania. Mr. J. W. Cozzens and Mr. O. E. McMullen of the Portland Cement Association presented a moving picture entitled "The Walnut Lane Memorial Bridge," as a feature of the program. The film showed the design and construction procedures used in building the first prestressed concrete bridge in the United States.

Missouri

The Ozark Chapter held its Annual Ladies Night on September 6 at the Crystal Room of the Kentwood Arms Hotel in Springfield with 79 members and guests present. Featured on the program were a style show, skits presented by the Springfield Little Theater Group and several dance solos. Each wife was presented with a hand painted Chinese ash tray.

New York

Cornell University has announced three courses for the New York Metropolitan Chapters of the NYSSPE, which are open to all engineers in the metropolitan area of New York. The three courses to be offered are: Industrial Organization Relationships; Professional Engineers and Some Problems of a Mobilizing Society and The Engineers' Role in Management Employee Relations.

Michigan

The Jackson Chapter of the Michigan Society held an open meeting for all engineers in the area at the Hayes Hotel in Jackson on September 26.

The program was presented jointly by M. C. Schafer, P.E., and J. B. Simpson, P.E., engineers of the Michigan Gas Storage Company, their subject being "The Story of Gas—Its Transportation, Storage and Delivery." A moving picture was also presented.

OUR AUTHORS

Dr. Alan T. Waterman, Director of the National Science Foundation, **(Why America Needs The National Science Foundation, page 12),** took office on April 6 of this year. Prior to his appointment, Dr. Waterman served as Deputy and Chief Scientist of the Office of Naval Research. As such he had primary responsibility for the scientific research program which the Navy carries on with colleges throughout the country.

A graduate of Princeton, Dr. Waterman took his Ph.D. in 1916. After serving with the Signal Corps during World War I, he joined the faculty of Yale University and remained in the Department of Physics there until 1948.

Dr. Waterman is a Fellow of the American Association for the Advancement of Science, the American Physical Society, the American Association of Physics Teachers, New York Academy of Sciences and Phi Beta Kappa among other honorary and scientific societies.

Engineer-lawyer Frank W. Shelton, Jr., **(Twentieth Century Pony Express, page 16),** Assistant to the Eastern Area General Manager of the American Telephone and Telegraph Long Lines Department, was born in Independence, Kansas. He took a B.A. from the University of Cincinnati and an LL.B. from the College of Law of Franklin University in Columbus, Ohio. He took post-graduate work at the College of Engineering and Commerce of the University of Cincinnati.

Mr. Shelton's positions have included editing the *Columbus Engineer* and the *Ohio Engineer*. For several years he was counsel to the Ohio Society of Professional Engineers. He is a past president of the North East Chapter of Ohio.

A registered professional engineer in Ohio, Mr. Shelton worked for the Ohio Department of Highways before joining the Long Lines' legal department in Cleveland in 1941. In 1946 he was appointed Assistant Division Attorney in Cleveland and in January, 1951, he moved to New York as an attorney. Mr. Shelton was named to his present position in July of this year.

New York State Society Makes Recommendations To New York Mayor

The following letter was sent to New York City Mayor Vincent Impellitteri by Edward B. Fitzpatrick, P. E., Chairman, Metropolitan Presidents' Conference of the New York State Society of Professional Engineers. Copies were sent to the members of the Board of Estimate, the Budget Director, and to Dr. Luther Gulick, Executive Director, Mayor's Committee on Management Survey.

"The five Metropolitan New York County Chapters of the New York State Society of Professional Engineers have studied the Griffenhagen Associates Preliminary Report as it applies to Engineering Positions in the Municipal Service of the City of New York. We find that the recommendations in this report violate Section 7202 of the Education Law of the State of New York, which reads in part:

"'It shall be unlawful for any person to practice or to offer to practice professional engineering or land surveying in this state or to use the title Engineer or Surveyor or any other title, sign, card or device in such manner as to tend to convey the impression that such person is practicing professional engineering or land surveying or is a professional engineer or land surveyor, unless such person is duly licensed under the provisions of this article.'

These violations fall under two categories:

1. Positions, the duties of which call for professional engineering work, but require no Professional Engineer's license.

2. Positions, the duties of which do not call for professional engineering work, but are given engineering titles.

In addition to the foregoing two violations, we find undesirable practices recommended. These practices fall under two categories:

1. Positions, the duties of which call for professional engineering work, but the titles are incompatible with the duties.

2. Positions, the duties of which call for professional engineering work, but the titles and duties are so narrow as to be impracticable and to limit the efficiency of the position.

Very truly yours,
EDWARD B. FITZPATRICK,
Chairman, Metropolitan Presidents' Conference

Edward B. Fitzpatrick, P. E., President, Bronx County Chapter;
Rev. Ronald B. MacDonald, President, Kings County Chapter;
H. Gregory Shea, P. E., President, New York County Chapter;
Karl Vaupel, P. E., President, Queens County Chapter;
Hugo H. Stenberg, P. E., President, Richmond County Chapter.

Western Chapter Of Missouri Holds E-I-T Meeting

The Western Chapter of the Missouri SPE held a dinner meeting on October 25 at the Wishbone Restaurant in Kansas City. The program was conducted by the Engineers-in-Training of the Western Chapter.

The meeting was opened with a report by M. J. Horney, P.E., Chairman of the Chapter's E-I-T Committee. A panel discussion followed on "The Young Engineer in Professional Practice." A. C. Kirkwood, P.E., State Director for the Chapter, reported to the Chapter on the state meeting of the Missouri Society.

The meeting was concluded with the presentation of a report on the Public Relations Program of the National Society, which was given by C. G. Roush, P.E., Chairman of NSPE's Public Relations Committee.

Hudson County Chapter Of New Jersey Society Hears Businessman

The Hudson County Chapter of the New Jersey Society held a dinner meeting on September 24 at the Meyer's Hotel in Hoboken. The featured speaker for the occasion was Mr. George H. Shay, Manager, Government Department, New England & Middle Atlantic States, Johns-Manville Corporation. His topic was "Socio-Engineering."

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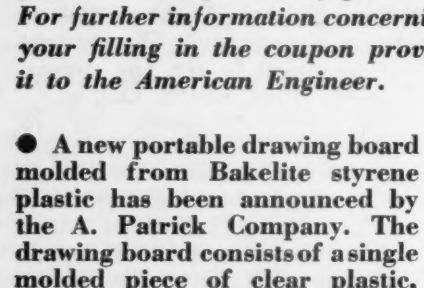
What's New

As a service to our readers, this column will describe briefly new product developments of general interest to professional engineers. For further information concerning these products, we will appreciate your filling in the coupon provided for this purpose, and mailing it to the American Engineer.

● A new portable drawing board molded from Bakelite styrene plastic has been announced by the A. Patrick Company. The drawing board consists of a single molded piece of clear plastic, 9¾ inches by 12¼ inches. Four corner clamps for attaching 8½ by 11 paper make it no longer necessary to carry thumb tacks.

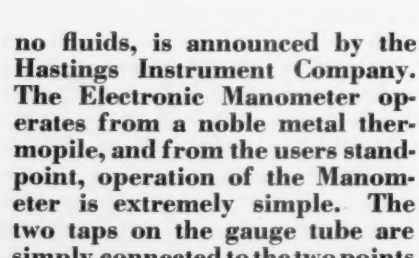


The clamps are cleverly recessed into the plastic so that the triangle or roller can ride freely over them without interference. Two metal straight edges, one vertical and one horizontal are cleverly retractable so that the triangles can be moved over all four edges of the paper. ***Number 1.***

● The Abrams Aerial Survey Corporation announces the availability of a new booklet, "Aerial Surveys and Maps from Photographs," which is a complete explanation of aerial surveying that is written in simple and non-technical language.

In the booklet the photogrammetric process is diagrammed, and subsequent pages illustrate the planes and cameras used in aerial photography, as well as the instruments used in the laboratory processing. Then the various maps and photographs that are available from aerial surveys are illustrated and explained along with the uses that can be made of each type. ***Number 2.***

● An entirely new type, highly sensitive Electronic Manometer and Flowmeter, having no glass or plastic tubes and containing no fluids, is announced by the Hastings Instrument Company. The Electronic Manometer operates from a noble metal thermopile, and from the users standpoint, operation of the Manometer is extremely simple. The two taps on the gauge tube are simply connected to the two points at which the pressure difference is to be measured. To use the instrument as a flowmeter, the tube is placed directly in the line for low flow rates or connected to pressure taps on two sides of a calibrated orifice for high flow rates.



Accessories available with the instrument include a 5-position switching attachment. This permits monitoring of gauge tubes in 5 locations with one indicating meter. The Electric Manometer is light weight, simple to operate, and highly stable with very low lag. Descriptive literature and prices are available upon request. ***Number 3.***

● Hot incandescent work lights may now be converted to cool fluorescent simply by screwing a Lite-Mite Bulb into any ordinary lamp socket. This Bulb contains two 4-watt fluorescent lamps and all control components entirely within the 2″ x 6″ shade—an exceptionally compact and efficient design. The entire fixture is hardly larger than the ordinary incandescent lamp, yet it produced over 400% more light for equal wattage.

Intense illumination of up to 500 footcandles at 3″ to 5″ working distance is provided yet the lamp shade never gets hot. ***Number 4.***

● The Cherry Rivet Company, announced the recent addition of Lock Bolts to their line of blind rivets and structural fasteners. Lock Bolts are high strength, two-piece fasteners, consisting of a pin and a collar. The pin is inserted in the work from one side, and the collar slipped onto the pin from the opposite side. A special pneumatic tool installs the Lock Bolt.

Cherry Rivet Company manufactures Lock Bolts in two series, Aircraft and Commercial. Diameters range from 3/16″ to 3/8″ and grip lengths from 1/8″ to 1-15/16″. A variety of head styles is available. ***Number 5.***

● A new 8-page booklet describing Anchorite 100, a paint-anchoring corrosion-resistant phosphate treatment for metals, has just been published by Octagon Process, Inc. Attractively printed in two colors, the booklet describes in detail the common cause of paint failure and how it can be prevented. It then goes into methods of application—immersion and spraying—of the Anchorite 100 treatment.

A separate discussion of typical products to which the Anchorite 100 process can be applied is well illustrated and includes a number of defense items. The booklet points out that Anchorite 100 is one of the few pre-painting treatments that meets the specifications for Class C (Type II) finish in U. S. Army Specification No. 57-02C, as well as JAN-C-490, Grade 1. Copies of this valuable booklet are now available without charge. ***Number 6.***

● A basically new light source, the 400 watt J-H1 fluorescent mercury-vapor lamp, is available from the Westinghouse Electric Corporation.

Designed to provide a whiter light from a mercury-vapor source, the bulb of the J-H1 has an inside coat of a phosphor that fluoresces red when activated by invisible ultraviolet light generated by the quartz arc. This tends to balance the spectrum to provide a light that is white enough for most industrial purposes.

For additional data on these products, fill out the coupon below and mail to the American Engineer.

Lower brightness of the J-H1 makes operation at lower mounting heights practical, which widens the field of use for mercury lamps. Increased fixture efficiency is obtained by removing the diffusing shield frequently used with the A-H1 type.

In addition to industrial use, this new lamp can be used for flood lighting and street lighting. When used outdoors, fixtures should be enclosed to prevent cracking of the glass bulb by driving rain or large moisture-laden insects. ***Number 7.***

● Safety, convenience and simplicity of operation are stressed in the new Hoist-Binder announced by Coffing Hoist Company. Since this load binder works on the ratchet hoist principle, it will take up or slack off a load chain any amount up to a full 20½ inches—or more if a longer chain is under in the binder.

According to the manufacturer, this advantage over eccentric type binders is especially important with "springy" loads where the binding chain or cable must be tightened by force through considerable distance in order to fully secure the load. Also, if a load settles in transit, the new Coffing unit is easily tightened any amount without the necessity of releasing the entire load to take a new "grab." Full strokes can be used for rapid take-up; half strokes permit minute adjustments. To further speed operation, the binder chain may be pulled freely through the ratchet when not under load.

The Coffing Hoist-Binder weighs only ten pounds, and will exert a pull of 3,000 pounds, according to the manufacturer. ***Number 8.***

● A lightweight, portable electronic signal flasher — without moving parts or filaments to burn out—assuring longer battery life and greater long range visibility—has been announced by the Haledy Electronics Company. This new, low cost flasher of cold cathode tube design emits a sharp brilliant flash of light clearly visible for approximately a mile with never failing dependability.

Unaffected by vibration, humidity or temperature in a compact splash and rainproof aluminum case measuring 6" x 6½" x 10" it weighs only 8½ pounds. It can be carried by handle for use wherever required.

The flasher utilizes a set of three standard 90 volt batteries in series, whose life is appreciably lengthened since all battery energy is directly used to generate the bright flashing signal and nothing else. Battery current is not wasted to make filaments glow, operate relay contacts, heat thermal elements or run motors.

An off/on switch as well as an outside knob to control the number of flashes per minute, is provided. A clear or colored precision Fresnel lens protects the life-time cold cathode tube. ***Number 9.***

● Drag-free anemometer characteristics and electronic data technique combine in this new and self-contained Beckman & Whitley system to provide accurate recordings of wind direction and wind speeds from a threshold below one mile per hour to 30 m.p.h. The unit is energized by its own battery supply and weighs only 100 pounds total—with batteries.

Because of the portability of the equipment, its freedom from critical adjustments, and its sealed and permanently lubricated moving parts, the system is suggested for field microclimatic studies, including: airport, agricultural, and smog surveys; river-flood forecasting; rocket and guided-missile research; and investigations of the light winds which have major influence on the build-up of effluents from smokestacks and other sources of industrial atmospheric contamination. ***Number 10.***

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Personality

(*Continued from page* 11)

if new seat and table mates are sought rather than restricted to those already known.

"When a good project is finished, it should have a story to tell. All technical magazines welcome well written articles. If the engineer has never written such material before, he should make a start. It is not necessary that the writing be highly polished. Published articles increase the reputation and improve the personality of all who write."

NSPE Past President Stolte, partner in a highly-respected firm of Minneapolis consulting engineers says:

"Personality and a good mind are *both* necessary if one is to be successful as an engineer. Let me give an example: I once held a high and responsible public administrative position which also had to do with the direction of a large number of engineering projects as well as other types of work.

"I may have spent 95% of my time and energies on other than engineering concern, but even in management I felt the 95% was successful only because of the 5% of engineering background present.

"There is no substitute for first knowing your subject; but, unless you have confidence in your own ability to communicate it to others, you may fall far short of your goal.

"We cannot all be top public speakers, but any approach to being such is an asset. . . .

"I have spent entire evenings playing cards, talking about fishing, hunting, golfing or other athletic sports, travel, politics or what have you. Possibly only one sentence or question during the entire evening was said about the primary purpose of my visit, and that maybe as I was saying goodby after an entertaining evening. . . .

"You can get the most interest from a person if you get them to talk about themselves or their special hobbies or interests. Never monopolize a scene. Always have an open mind for discussion of all sides of a question.

"I might sum up by saying that a pleasing personality is most helpful and can be developed when not present. We must encourage young engineers to join a technical and a professional society as well as other civic and political groups and urge them to take an active part in its work. I have seen both young and older engineers develop personality, composure and convincing deliveries right in our own Chapter meetings over a period of several years.

"I would say that a good personality is indispensable to really enjoy life and to get along with people, but unless backed up by a good mind, it all becomes rather shallow. In turn, a good mind has not really come to fruitful maturity without a good personality."

Professor Joe Butler, chairman of the Civil Engineering Department of the Missouri School of Mines in Rolla, Missouri, a prominent NSPE member, has, at our request, sent in some student case histories as well as giving his comments:

"In general, mental ability and personality are set up as prerequisites to advancement to important positions in engineering.

"Those who graduate from our engineering courses with minimum graduating grades, with average grades, or with grades below those of the high scholarship group have with the aid of good personalities been able to attain top positions of authority.

Only free peoples can hold their purpose and their honor steady to a common end, and prefer the interests of mankind to any narrow interest of their own.
—Woodrow Wilson

"In few engineering positions does the work assigned to the young graduate engineer come up to the mathematical and design standards of difficulty taught in the senior year. This drop from the more difficult problem and design tasks of the senior year to the routine tasks of most engineering employment comes as a great shock to the average high scholarship man while there is more of relief than of shock to the man of lower scholarship.

"Many employers offering only the most routine of work for their new men would do well to pass up the high scholarship group because the dissatisfaction of these men with the routine work will affect their interest and loyalty and will cause them to leave for employment of a more technical nature at the earliest opportunity.

"I have listened to the pained criticism of these top scholarship students. Fortunately not too many of these men fail to adjust themselves, but they do tend to flock to structural design and to other technical computation work. However, the chance for real promotion comes more often to our younger graduates who do not tie

(*Continued on page* 32)

"Foundation"

(*Continued from page* 15)

Protein Synthesis

Research in protein synthesis has reached a stage where leading investigators believe that a determined, cooperative attack may be successful. Protein is the universal substance in living creatures which enables them to utilize the energy in food. Protein also is the common source of serums for combating disease. At present these serums are generally taken from animals inoculated with the disease, but unfortunately, such protein serums often include components or impurities which may produce dangerous secondary reactions in human patients. Artificially produced proteins made in the laboratory would be pure and free from these undesirable toxic effects. Not only that, but the production of synthetic protein would immediately open a vast field closely related and necessary to the field of development or artificial foods and fuels.

I HAVE mentioned a few important areas in which basic research can play an outstanding role. However, it should be stressed that these present potentialities have come from years of fundamental research on the part of scientists and engineers generally. Basic studies in science continually generate potential for successful application. The outstanding discoveries which result from basic research have been used by man to enrich his life and to increase his power over his environment. The National Science Foundation hopes to take the lead both in the support of research at the frontier of scientific knowledge and in encouraging the prompt capitalization of the findings of research.

Training of Scientific Manpower

Now what about the other basic program of the National Science Foundation, the training of scientific manpower through research grants and fellowships?

Members of the National Society of Professional Engineers are already familiar with the critical shortage of scientific personnel. It is not necessary to dwell at length on the subject.

During the next three years the output of engineering graduates from colleges and universities in the United States will decline at an alarming rate. Because of selective service requirements and the depletion of GI benefits, there will be only one-third as many engineering graduates in 1954 as there were in 1950. Official estimates indicate that 17,000 engineers will graduate in 1954. The estimated defense requirement for new engineers for the same year exceeds 30,000. A similar situation holds for scientists, both for college graduates majoring in science and for those taking advanced degrees.

THE defense budget has increased four-fold and the military research and development effort more than three-fold. The demand and urgent need for scientists and engineers is rising accordingly, but the supply is apparently decreasing in inverse ratio to the demand.

For fiscal year 1952 the National Science Foundation plans to award several hundred graduate fellowships in the sciences and engineering. These fellowships will make it possible for the most able young college graduates to begin graduate studies and to become fully trained operating scientists and engineers. By this item alone—by adding to the supply of trained scientific and engineering manpower—the National Science Foundation will make a unique and invaluable contribution to the present emergency.

Leaders of the engineering profession can do much toward explaining the significance of these programs to the public at large. As scientifically trained men, engineers can grasp their urgency. Members of the National Society of Professional Engineers can make significant contribution to the nation's long run welfare by clarifying the objectives of the National Science Foundation in their own communities.

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What They're Saying

(*Continued from page* 21)

1. Where engineering publications now circulate abroad.
2. In which libraries in the world they can be seen and read.
3. Where training centers for engineers and technicians exist.
4. Where foreign students who have received an engineering training in our own universities and colleges are now practicing.

Having collected and classified all this information the next step would be to devise ways and means of utilizing this data to provide a worldwide distribution of engineering periodicals, reports and books on subjects of interest in furthering international co-operation.

John Stuart Mill said that he doubted whether all the inventions of machinery have on balance added to human happiness. Our training and experience give us the right approach to the problem. As much as anybody we find ourselves involved up to the hilt in it since failure to preserve peace diverts the products of our engineering knowledge and skill into the path of Satan. Surely it is up to us to take into full account the human as well as the technical realities.

The engineer is frequently criticized for being too narrow in his interests, for limiting his responsibility to the functional design of machines and structures, and leaving to others all concern for their impact upon society. If the responsibilities of the engineer are to be broadened to include a proper appreciation of the social consequences of his professional efforts then it must be demonstrated that these responsibilities can be assumed without departing from the fundamental concepts and approach of engineering. To bring such a demonstration about, however, the scope of engineering must be broadened to the extent that the social and human problems can be defined in quantitative terms and dealt with in the ways of the engineer.

Sir Alexander Gibb once said that, "The sound engineer is neither the academic searcher after novelty, nor yet he who plays always for safety first, and safeguards his own reputation at the expense of his client; but it is the engineer who most closely identifies himself with his client's real interests." Can we not regard the client in Sir Alexander's words in this context as the world around us?

—C. W. N. McGowan, Journal of the Engineers' Guild, London, England, September, 1951.

Personality

(*Continued from page* 30)

themselves so closely to this detail work.

"As security is not all a matter of higher salary or more and more money and as office design and detail work permits a man to be at home each night it is possible that a higher percentage of these men attain essential security in 'a happy home life' probably the principal influence in the security of adults."

CASE HISTORY ONE

In the early nineteen-twenties "Kenneth" a C.E. grad, was employed by a mid-west state highway department. He enabled a paving contractor to save money and the department to secure a finished pavement on time by helping the contracting outfit to carry on a job to completion in spite of the illness of the contractor's superintendent.

As a reward, he was employed as superintendent by this contractor during the following year. With his salary and a bonus he received about two-and-a-half times the pay he had been receiving before as a state highway department engineer.

My first reaction was that it was "Kenneth's" personality and ability to "handle men" that did the trick. But later I have been convinced that it was more the matter of job organization and management rather than of either "a good personality or of a good brain."

CASE HISTORY TWO

"Red," a cheer leader with no scholastic leanings or attainments, was finally invited by the Faculty to leave school. Some six months later "Red," having sold himself to a southwestern mining company, sent employment telegrams to a number of recent graduates in Mining whose subsequent employment and competence assured Red's retaining a very attractive supervisory position.

CASE HISTORY THREE

A graduate was known for his love of detailed computations. However, no superior who wanted a ready round-numbered estimate of materials or costs for general policy purposes dared give this man the assignment. He disdained short-cuts and rule-of-thumb methods and insisted on taking two days to do what others in the office could do in 15 to 30 minutes.

CASE HISTORY FOUR

Our students are advised that the supervisory executive and sales positions ordinarily carry financial gains beyond that paid by office computation, design, research, and teaching positions.

Mr. J. Elmer Housley, District Power Manager of the Aluminum Company of America at Alcoa, Tennessee, another of our panel of experts, has this to say:

"In the study of the personality factor there are great rewards awaiting NSPE in encouraging engineers to lend the helping hand to engineers in all age groups. Such help may be extended personally by the development of discussion groups in the chapters of the State Societies.

"There could be discussed the problems of winning friends, working with associates, becoming active in social and civic duties, which may include city and county commissions, schools, contacts with members of legislative bodies, encouragement of continuing education, and so forth.

"Generally speaking, such activities require a division of time, *a sacrifice of objectivity, a lessening of cerebral processes and more time for doing things.*

"Business-wise, a study of opportunities existing and a conscious development to fit in to such opportunities or a definite acceptance of a limited field without prejudice, are choices facing many engineers.

"Managing engineers have an awareness of the need to search out all the latent abilities of a man and by appropriate assignments give the proper climate for development of talent. The article THE AMERICAN ENGINEER is preparing will give encouragement to the engineer for his full participation in adding to his growth, and appreciation of professional stature."

To complete our discussion, THE AMERICAN ENGINEER asked one of its most prominent members, Mr. Ole Singstad, builder of the Holland Tunnel, and probably the profession's greatest authority on tunnels, to give us his comment on Dr. Link's statement that: "So far as it affects security, a good personality is more important than a good mind."

Mr. Singstad says: "The quoted statement by Dr. Link appears startling and one's first reaction would be to say—no, I do not agree with it. However, upon reading his definitions of "security," "a good mind," and "personality" the negative answer is not so obvious.

"What makes the difference I think is the fact that Dr. Link evolves his own somewhat unorthodox definitions of security, a good mind and personality.

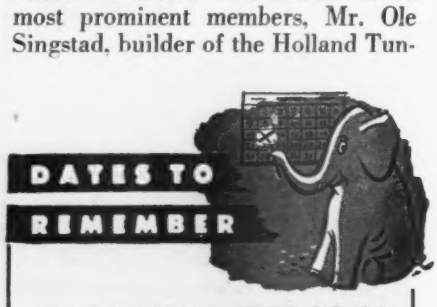
"Security, he explains, is possessed by one who is sure of himself. Personality, he says, is measured by the extent to which the individual has developed habits and skills which interest and serve others, the spiritual equivalent of which is 'thou shalt love thy neighbor as thyself' and he says 'a good mind depends on what one knows about things and people . . .'

"I shall not dwell upon his definition of security but when he has stripped a 'good mind' of everything but what one knows about things and people, I think he has departed from what has heretofore been considered a part of a good mind, such things as the ability to think straight, which Dr. Link has thrown into a large single package, including such things as moral and ethical standards and a great many other attributes usually considered as reflecting a person's character and called his personality.

"One may not agree with these definitions; I certainly do not fully agree with them; but measured by those definitions as a yardstick, I see nothing startling about Dr. Link's statement.

"Dr. Link apparently is a practitioner in psychological counseling and it may well be that in his practice he comes in contact with cases that border on the abnormal. Could it be that the young engineer whom he cites as an example came in this category?

"I believe that the pleasing personality development should certainly not be of the 'Babbitt' type. I do not believe that for a successful engineer there is any substitute for a good mind as I understand that term, which includes the ability to think straight and independently, including of course an amount of knowledge appropriate for his occupation, good physical and mental health, a good character, high standards of ethics and the ability to meet and get along with people, but not to the extent of yielding to points based upon improper



Board of Directors, National Society of Professional Engineers—Fall Meeting. November 9 and 10. Continental Hotel, Kansas City, Missouri.

Arizona Society of Professional Engineers—Annual Meeting. November 23 and 24. Phoenix.

Florida Society of Professional Engineers—Annual Meeting. November 29 and 30. Soreno Hotel, St. Petersburg.

Indiana Society of Professional Engineers—Annual Meeting. November 30 and December 1. Fowler Hotel, Lafayette.

Texas Society of Professional Engineers—Annual Meeting. January 24, 25 and 26, 1952. Buccaneer Hotel, Galveston.

motives and to refrain from efforts at 'winning' regardless of the means and methods employed.

"In the case of a professional man such as an engineer, whether young or old, in addition to engaging in as many of the admirable activities as circumstances will permit which Dr. Link recommends, he should not miss the opportunity to associate with his fellow engineers, attending their meeting and taking part in the activities of engineering societies."

Now, THE AMERICAN ENGINEER has a request to make of its readers. What do you think about personality as a factor in engineering success? Can you give us some interesting examples of the role personality has played in your career? In that of your friends? THE AMERICAN ENGINEER would like to explore this problem of personality as a success factor further and it needs your help to do so.

The divine right of kings may have been a plea for feeble tyrants, but the divine right of government is the keystone of human progress, and without it governments sink into police, and a nation is degraded into a mob.

—Disraeli

Why not sit down today and write us a letter giving us some *specific* details? If we can gather together enough material of value, we will print another article from material supplied by readers. The purpose of this article would be to pass along usable information for the benefit of all members of NSPE.

How can engineers, individually, and as a profession, develop a better personality? What do you think?

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EDITORIALS

The First Step . . .

As the AMERICAN ENGINEER goes to press we are happy to announce that the first mailing of questionnaires on the Executive Research Survey, *How to Improve Engineering-Management Communication,* has been sent to over 2,000 top management executives in all segments of American industry.

We believe that the survey will make a significant contribution to the subject, and will bring NSPE and NSPE members to the favorable attention of top management everywhere. We wish to thank our members for the splendid spirit of cooperation which has made the public relations program possible.

The Old Problem: Lack of Recognition

In the *Congressional Record* of October 18, 1951, Senator Lehman of New York was gracious enough to cite a statement filed by the National Society of Professional Engineers with the Senate Committee on Labor and Public Welfare in support of a bill he introduced to give all statutory Assistant Surgeons General of the Public Health Department equal rank—that equal to a major general in the Army.

This is an interesting bill. Though technical and presumably of rather narrow interest, it provides a splendid case history of the way in which engineers customarily lag behind other professions in seeking recognition for their profession.

NSPE became interested in the matter in this way: The American Dental Association caused a bill to be introduced which provides that the chief dental officer of the Public Health Service be given by law a rank equal to that of major general in the Army. (Under the present law, half of the Assistant Surgeons General have such rank, the others, including the Chief Engineer, have rank equal to a brigadier general.)

At the hearings on the bill, it became apparent that the Chief Engineer has responsibilities in excess of those of the chief Dental officer. While we have no objection to the Dental Profession being given recognition through their chief Dental officer (indeed, we favor such action) we felt that the engineering profession deserved similar recognition and said so to the Senate Committee.

Indications are that the Assistant Surgeon General for engineering will get such recognition; indeed, that all Assistant Surgeon Generals will have equal rank—an eminently sensible arrangement we think.

The point of all this is that it is important that someone speak up on these matters. There is a lot of such speaking up to do and NSPE proposes to do it on behalf of the profession. Engineers have given much to humanity for which they have not received proper credit. Engineers often bear responsibilities far in excess of those who receive more economic and prestige-value rewards than themselves. NSPE conceived its function to be to change this and we are devoting ourselves to that aim.

Thinking Ahead . . .

Plans are already underway for the 1952 Engineers' Week celebration. As recently announced by C. G. Roush, Chairman of NSPE's Public Relations Committee, the Engineers' Week Kit will be mailed to all Chapters and Societies on the fifteenth of this month. This means that local activity can be planned now, in order to establish a smooth program for the Week. Chapter chairmen for Engineers' Week should be appointed right away, if they have not already been named, in order to give them plenty of time to formulate their plans, appoint their assistants, and in general arrange for a successful Engineers' Week celebration in their community.

The Kit this year will be divided into four sections: Radio and TV; Newspaper Publicity; Public Speaking and Special Projects. By concentrating the material in this manner, members who are most qualified in these various fields may be appointed as chairmen of four sub-committees. The four activities may be coordinated with the Chapter's Engineers' Week chairman. In this way, the total responsibility for promoting the Kit need not fall on one man, although he should keep in close contact with all phases of planning and execution.

Getting an early start in a promotional activity of this type is most valuable. Working up ideas for window displays and arranging for space, or planning an essay contest take careful thought and preparation. Casting a radio show and rehearsing it is also a time-consuming project. These and many other activities suggested in the Kit will take time if they are to appear polished and be successful.

The proverbial "early bird" not only got the worm, but a lot of publicity, if we are to judge from the fable's popularity. Alert NSPE Chapters will also find that planning for the future, in this case the week of February 17-23, will pay off.